

ProMix[®] 2KS

312775F

Plural Component Proportioner

EN

Manual system for proportional mixing of plural component coatings.
For professional use only.

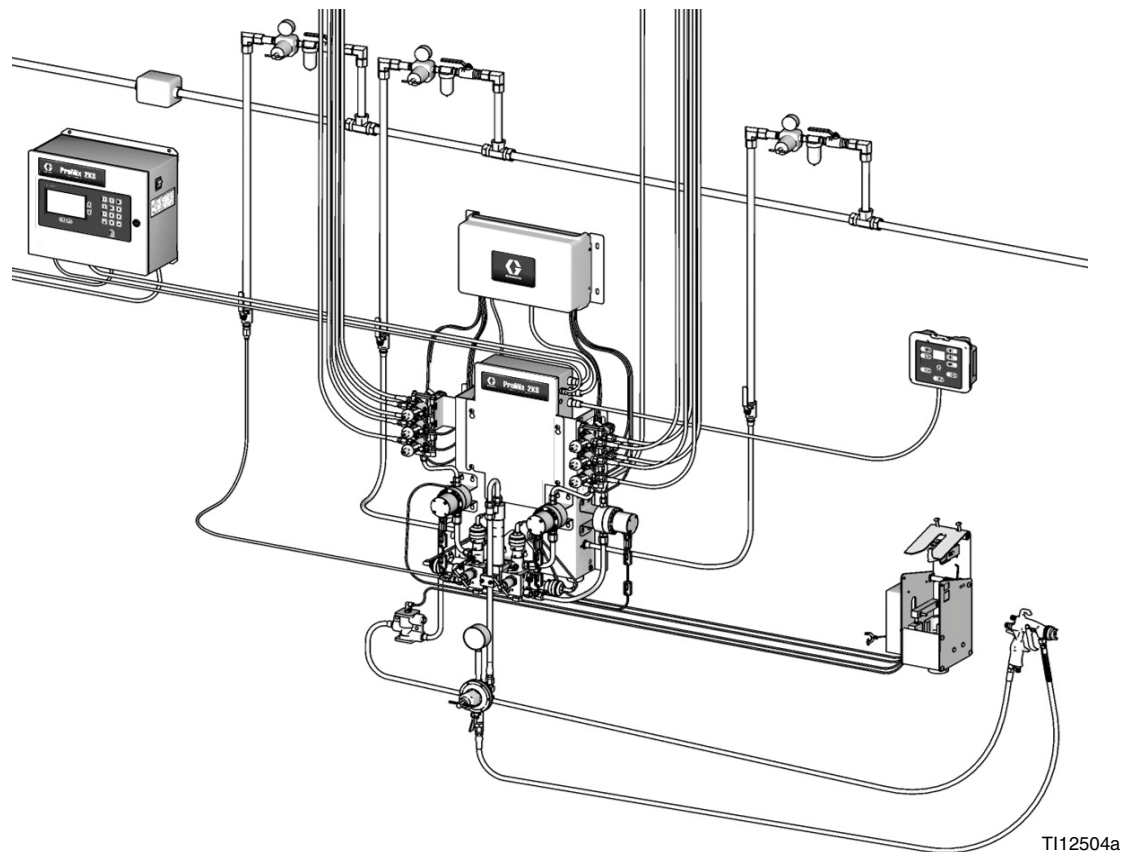
For use in explosive atmospheres (except the EasyKey).



Important Safety Instructions

Read all warnings and instructions in this manual. Save these instructions.

See page 4 for model information, including maximum working pressure. Equipment approval labels are on page 3. Some components shown are not included with all systems.



Contents

Related Manuals	3
Equipment Approvals	3
System Configuration and Part Numbers	4
Configurator Key	4
Standard Features	5
Accessories	6
Warnings	7
Important Two-Component Material Information	9
Isocyanate Conditions	9
Material Self-ignition	9
Keep Components A and B Separate	9
Moisture Sensitivity of Isocyanates	9
Changing Materials	9
Component Identification and Definition	10
Location	12
Location Requirements	12
Intrinsically Safe Installation Requirements	12
Optional Cables	12
General Information	14
Wall Mounting	14
Air Supply	14
Requirements	14
Air Connections	15
Fluid Supply	16
Requirements	16
Fluid Connections	16
Setup the Fluid Manifold for Dynamic Dosing	18
Solvent Meter Accessory	20
Electrical	21
Requirements	21
Connect Main Power	21
Connect EasyKey to Fluid Station Control	22
Connect Booth Control to Fluid Station Control	22
Fluid Station Control Board Switch Settings	23
Connect Color Change Module	24
Grounding	27
Check Resistance	27
Schematic Diagrams	29
System Pneumatic Schematic	29
System Electrical Schematic	30
Dimensions and Mounting Hole Layouts	32
Dynamic Dosing Restrictor Selection Graphs	34
Technical Data	41
Graco Standard Warranty	42
Graco Information	42

Related Manuals

Component Manuals in English

Manual	Description
312776	ProMix 2KS Manual System Operation
312777	ProMix 2KS Manual System Repair-Parts
312781	Fluid Mix Manifold
312782	Dispense Valve
312783	Color Change Valve Stacks
312787	Color Change Module Kit
312784	Gun Flush Box Kits
310745	Gun Air Shutoff Kit
312786	Dump Valve and Third Purge Valve Kits
312785	Network Communication Kits
308778	G3000/G3000HR Flow Meter
313599	Coriolis Flow Meter
313290	Floor Stand Kit
313542	Beacon Kit
313386	Basic Web Interface/Advanced Web Interface
406799	15V256 Automatic System Upgrade Kit
406800	15V825 Discrete I/O Board Kit

Equipment Approvals

Equipment approvals appear on the following labels which are attached to the Fluid Station and EasyKey™. See FIG. 1 on page 4 for label locations.

EasyKey and Fluid Station Label

ATEX Certificate is listed here

ProMix® 2KS Electronic Proportioner

ATEX Certificate is listed here

Intrinsically Safe (IS) System. Install per IS Control Drawing No. 289833. EasyKey Interface IS Associated Apparatus for use in non hazardous location, with IS Connection to Smart Fluid Plate IS Apparatus for use in: Class I, Division 1, Group D T3 Hazardous Locations

Read Instruction Manual
Warning: Substitution of components may impair intrinsic safety.

Part Information:

PART NO.	SERIES	SERIAL

MFG. YR.

--

GRACO INC.
P.O. Box 1441
Minneapolis, MN 55440 U.S.A.

CE 0359

MAX AIR WPR

.7	7	100
MPa	bar	PSI

MAX FLUID WPR

MPa	bar	PSI

MAX TEMP 50°C (122°F)

Fluid Station Label

ProMix® 2KS FLUID PANEL

Part Information:

PART NO.	SERIES	SERIAL	MFG. YR.

MAX AIR WPR

.7	7	100
MPa	bar	PSI

Intrinsically safe equipment for Class I, Div 1, Group D, T3
Ta = -20°C to 50°C
Install per 289833

CE 0359

FM08ATEX0073
II 2 G Ex ia IIA T3

GRACO INC.
P.O. Box 1441
Minneapolis, MN 55440 U.S.A.

Artwork No. 293538

TI13581a

ATEX Certificate is listed here

EasyKey Label

ProMix® 2KS POWER REQUIREMENTS

Part Information:

PART NO.	SERIES NO.	MFG. YR.

VOLTS 85-250 ~

AMPS 2 AMPS MAX

50/60 Hz

GRACO INC.
P.O. Box 1441
Minneapolis, MN 55440 U.S.A.

Um: 250 V

Intrinsically safe connections for Class I, Div 1, Group D
Ta = -20°C to 50°C
Install per 289833

CE 0359

FM08ATEX0072
II (2) G Ex ia IIA

Artwork No. 293467

TI13582a

ATEX Certificate is listed here

System Configuration and Part Numbers

Configurator Key

The configured part number for your equipment is printed on the equipment identification labels. See FIG. 1 for location of the identification labels. The part number includes one digit from each of the following six categories, depending on the configuration of your system.

Manual System	Control and Display	A and B Meter	Color Valves	Catalyst Valves	Applicator Handling
M	D = EasyKey with LCD Display	0 = No Meters 1 = G3000 (A and B) 2 = G3000HR (A and B) 3 = 1/8 in. Coriolis (A) and G3000 (B) 4 = G3000 (A) and 1/8 in. Coriolis (B) 5 = 1/8 in. Coriolis (A) and G3000HR (B) 6 = G3000HR (A) and 1/8 in. Coriolis (B) 7 = 1/8 in. Coriolis (A and B)	0 = No Valves (single color) 1 = Two Valves (low pressure) 2 = Four Valves (low pressure) 3 = Seven Valves (low pressure) 4 = Twelve Valves (low pressure) 5 = Two Valves (high pressure) 6 = Four Valves (high pressure)	0 = No Valves (single catalyst) 1 = Two Valves (low pressure) 2 = Four Valves (low pressure) 3 = Two Valves (high pressure)	1 = One Air Flow Switch Kit 2 = Two Air Flow Switch Kits 3 = One Gun Flush Box Kit 4 = Two Gun Flush Box Kits

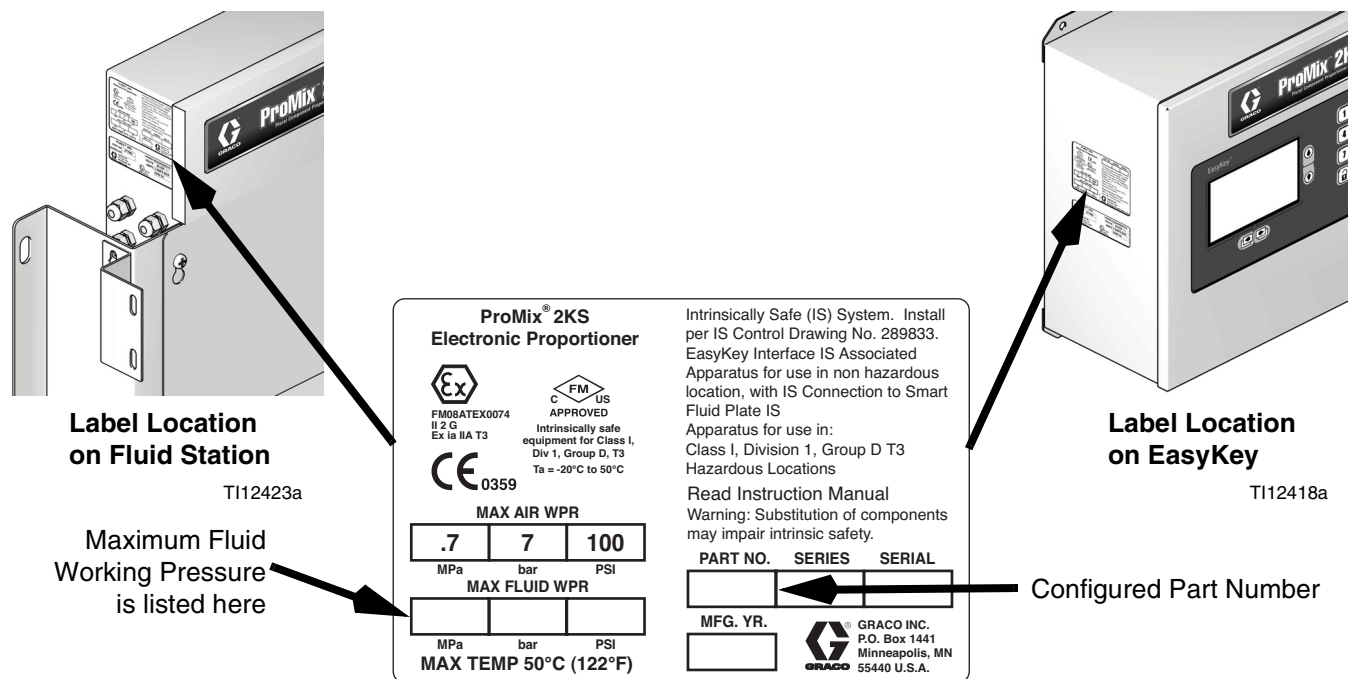


FIG. 1: Identification Label

Hazardous Location Approval

Models using a G3000, G3000HR, or intrinsically safe Coriolis meter for both A and B meters are approved for installation in a Hazardous Location - Class I, Div I, Group D, T3 or Zone I Group IIA T3.

Maximum Working Pressure

Maximum working pressure rating is dependent on the fluid component options selected. ***The pressure rating is based on the rating of the lowest rated fluid component.*** Refer to the component pressure ratings below.
Example: Model MD2531 has a maximum working pressure of 3000 psi (21 MPa, 210 bar).

Check the identification label on the EasyKey or fluid station for the system maximum working pressure. See FIG. 1.

ProMix Fluid Components Maximum Working Pressure

Base System (no meters [option 0], no color/catalyst change [option 0])	4000 psi (27.58 MPa, 275.8 bar)
Meter Option 1 and 2 (G3000 or G3000HR)	4000 psi (27.58 MPa, 275.8 bar)
Meter Option 3, 4, 5, 6, and 7 (one or two Coriolis Meters)	2300 psi (15.86 MPa, 158.6 bar)
Color Change Option 1, 2, 3 and 4 and	
Catalyst Change Option 1 and 2 (low pressure valves)	300 psi (2.07 MPa, 20.6 bar)
Color Change Option 5 and 6 and	
Catalyst Change Option 3 (high pressure valves)	3000 psi (21 MPa, 210 bar)

Flow Meter Fluid Flow Rate Range

G3000	75-3800 cc/min. (0.02-1.0 gal./min.)
G3000HR	38-1900 cc/min. (0.01-0.50 gal./min.)
Coriolis Meter	20-3800 cc/min. (0.005-1.00 gal./min.)
S3000 Solvent Meter (accessory)	38-1900 cc/min. (0.01-0.50 gal./min.)

Standard Features

Feature
EasyKey with LCD
Fiber Optic and Power Cables, 50 ft (15.25 m)
Wall Mount Fluid Station, 50 cc Integrator and Static Mixer
A Side Dump Valve, if color valve(s) selected
B Side Dump Valve, if catalyst valve(s) is selected
Booth Control
Basic Web Interface

Accessories

Accessory
Gun Flush Box Gun Insert Selection
15V354 Third Purge Valve Kit
15V536 Solvent Flow Switch Kit
15V213 Power Cable, 100 ft (30.5 m)
15G710 Fiber Optic Cable, 100 ft (30.5 m)
15U955 Injection Kit for Dynamic Dosing
15V034 10 cc Integrator Kit
15V033 25 cc Integrator Kit
15V021 50 cc Integrator Kit
24B618 100 cc Integrator Kit
15W034 Strobe Light Alarm Indicator Kit
15V337 Advanced Web Interface
15V256 Automatic Mode Upgrade Kit
280555 S3000 Solvent Flow Meter Kit

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 WARNING	
	FIRE AND EXPLOSION HAZARD Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. To help prevent fire and explosion: • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static arc). • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Ground all equipment in the work area. See Grounding instructions. • Use only grounded hoses. • Hold gun firmly to side of grounded pail when triggering into pail. • If there is static sparking or you feel a shock, stop operation immediately. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
	ELECTRIC SHOCK HAZARD This equipment must be grounded. Improper grounding, setup, or usage of the system can cause electric shock. • Turn off and disconnect power at main switch before disconnecting any cables and before servicing equipment. • Connect only to grounded power source. • All electrical wiring must be done by a qualified electrician and comply with all local codes and regulations.
	INTRINSIC SAFETY Intrinsically safe equipment that is installed improperly or connected to non-intrinsically safe equipment will create a hazardous condition and can cause fire, explosion, or electric shock. Follow local regulations and the following safety requirements. • Only models with a G3000, G250, G3000HR, G250HR, or intrinsically safe Coriolis meter are approved for installation in a Hazardous Location - Class I, Div I, Group D, T3 or Zone I Group IIA T3. • Do not install equipment approved only for a non-hazardous location in a hazardous area. See the ID label for the intrinsic safety rating of your model. • Do not substitute or modify system components as this may impair intrinsic safety.

 WARNING	
	SKIN INJECTION HAZARD High-pressure fluid from gun, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment. • Tighten all fluid connections before operating the equipment. • Do not point gun at anyone or at any part of the body. • Do not put your hand over the spray tip. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow Pressure Relief Procedure in this manual, when you stop spraying and before cleaning, checking, or servicing equipment.
	EQUIPMENT MISUSE HAZARD Misuse can cause death or serious injury. • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS forms from distributor or retailer. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	TOXIC FLUID OR FUMES HAZARD Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed. • Read MSDS's to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines. • Always wear chemically impermeable gloves when spraying or cleaning equipment.
	PERSONAL PROTECTIVE EQUIPMENT You must wear appropriate protective equipment when operating, servicing, or when in the operating area of the equipment to help protect you from serious injury, including eye injury, inhalation of toxic fumes, burns, and hearing loss. This equipment includes but is not limited to: • Protective eyewear • Clothing and respirator as recommended by the fluid and solvent manufacturer • Gloves • Hearing protection

Important Two-Component Material Information

Isocyanate Conditions

						
Spraying or dispensing materials containing isocyanates creates potentially harmful mists, vapors, and atomized particulates. Read material manufacturer's warnings and material MSDS to know specific hazards and precautions related to isocyanates. Prevent inhalation of isocyanate mists, vapors, and atomized particulates by providing sufficient ventilation in the work area. If sufficient ventilation is not available, a supplied-air respirator is required for everyone in the work area. To prevent contact with isocyanates, appropriate personal protective equipment, including chemically impermeable gloves, boots, aprons, and goggles, is also required for everyone in the work area.						

Material Self-ignition

						
Some materials may become self-igniting if applied too thickly. Read material manufacturer's warnings and material MSDS.						

Keep Components A and B Separate

						
Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination of the equipment's wetted parts, never interchange component A (isocyanate) and component B (resin) parts.						

Moisture Sensitivity of Isocyanates

Isocyanates (ISO) are catalysts used in two component coatings. ISO will react with moisture (such as humidity) to form small, hard, abrasive crystals, which become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity. If used, this partially cured ISO will reduce performance and the life of all wetted parts.

NOTE: The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

To prevent exposing ISO to moisture:

- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. **Never** store ISO in an open container.
- Use moisture-proof hoses specifically designed for ISO, such as those supplied with your system.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Never use solvent on one side if it has been contaminated from the other side.
- Always lubricate threaded parts with ISO pump oil or grease when reassembling.

Changing Materials

- When changing materials, flush the equipment multiple times to ensure it is thoroughly clean.
- Always clean the fluid inlet strainers after flushing.
- Check with your material manufacturer for chemical compatibility.
- Most materials use ISO on the A side, but some use ISO on the B side.

Component Identification and Definition

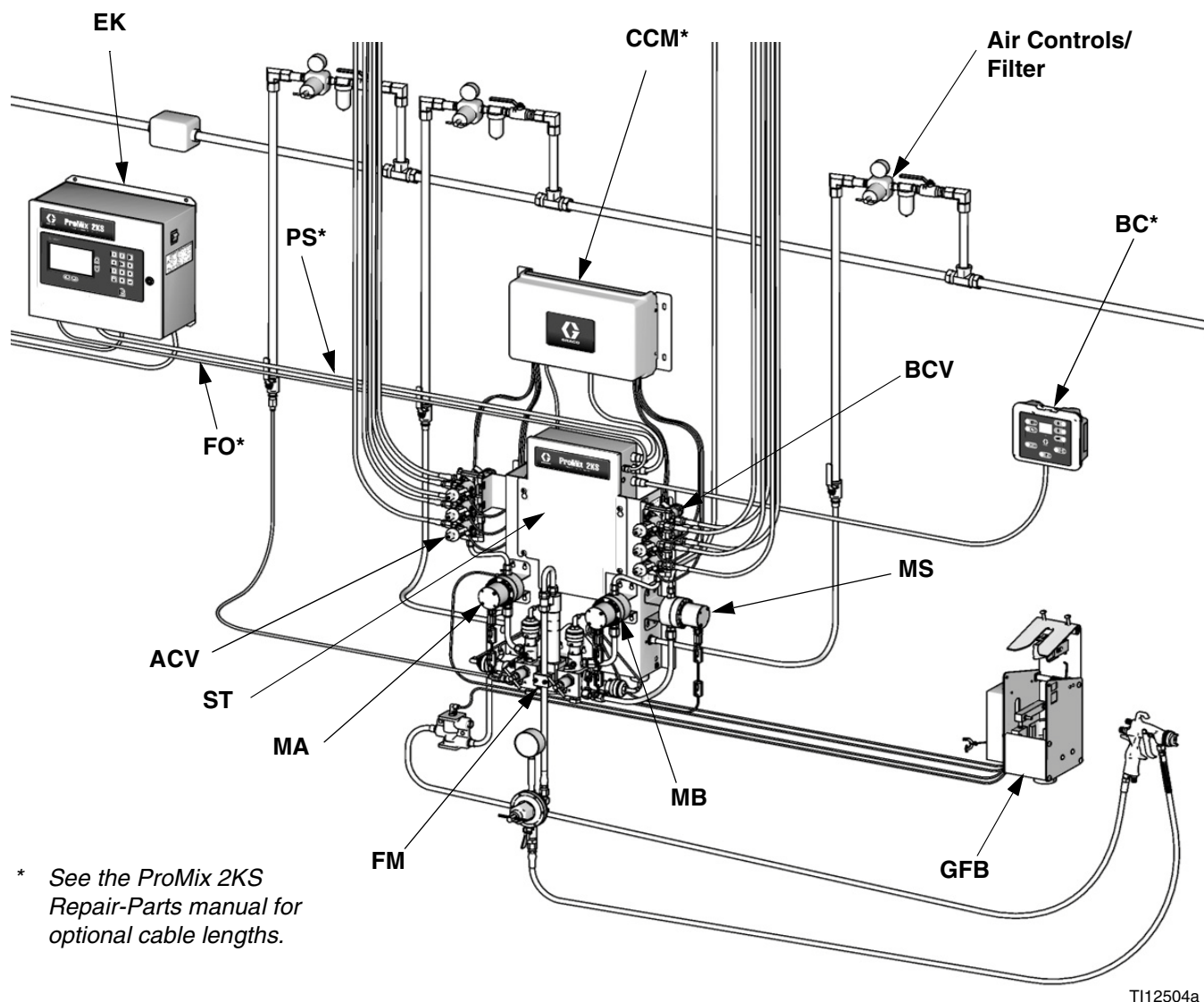


FIG. 2. Manual System, shown with G3000 Meters, Color/Catalyst Change, One Gun Flush Box, and Accessory Solvent Flow Meter

Table 1: Component Descriptions

Component	Description
EasyKey (EK)	Used to set up, display, operate, and monitor the system. The EasyKey accepts 85-250 VAC, 50/60 Hz line power and converts that power to acceptable low voltage and optical signals used by other system components.
Booth Control (BC)	Used by the operator for daily painting functions including: choosing recipes, initiating job complete, reading/clearing alarms, and placing the system in Standby, Mix, or Purge mode. It is typically mounted inside the booth or near the painter.
Fluid Station (ST)	Includes air control solenoids, flow switches, and mountings for the fluid flow meters and the fluid manifold assembly. Its control board manages all proportioning functions.

Table 1: Component Descriptions

Component	Description
Fluid Manifold (FM)	• Pneumatically Operated Dose Valves for component A and B • Purge Valves for solvent and air purge • Sampling Valves for calibrating the flow meters and performing ratio checks • Shutoff Valves for component A and B to close their fluid passages to the mix manifold, to allow for accurate calibration and ratio checks • Mix Manifold, which includes the fluid integrator and static mixer. → Fluid Integrator is the chamber where component A and B align at the selected ratio and begin to mix. → Static Mixer has 24 elements to uniformly blend the materials downstream of the fluid integrator.
Flow Meters (MA, MB, MS)	The following optional flow meters are available from Graco: • G3000 is a general purpose gear meter typically used in flow ranges of 75-3800 cc/min. (0.02–1.0 gal/min.), pressures up to 4000 psi (28 MPa, 276 bar), and viscosities of 20–3000 centipoise. The K-factor is approximately 0.119 cc/pulse. • G3000HR is a high resolution version of the G3000 meter. It is typically used in flow ranges of 38–1900 cc/min. (0.01–0.5 gal/min.), pressures up to 4000 psi (28 MPa, 276 bar), and viscosities of 20–3000 centipoise. The K-factor is approximately 0.061 cc/pulse. • S3000 is a gear meter used for solvents in flow ranges of 38-1900 cc/min. (0.01–0.50 gal/min.), pressures up to 3000 psi (21 MPa, 210 bar), and viscosities of 20–50 centipoise. The K-factor is approximately 0.021 cc/pulse. Required to use the Solvent Push feature. • Coriolis is a specialty meter capable of a wide range of flow rates and viscosities. This meter is available with 1/8 in. or 3/8 in. diameter fluid passages. For detailed information on the Coriolis meter, see manual 313599. The K-factor is user-settable; at lower flow rates use a lower K-factor. → 1/8 in. fluid passages: set K-factor to .020 or .061. → 3/8 in. fluid passages: set K-factor to .061 or 0.119.
Color Change Valves (ACV) and Color Change Module (CCM)	An optional component. It is available as a color change valve stack for either low or high pressure with up to 30 color change valves. Each stack includes one additional valve for solvent to clean the fluid line between color changes.
Catalyst Change Valves (BCV)	An optional component. It is available as a catalyst change valve stack for either low or high pressure with up to 4 catalyst change valves. Each stack includes one additional valve for solvent to clean the fluid line between catalyst changes.
Dual Fiber Optic Cable (FO)	Used to communicate between the EasyKey and Wall Mount Fluid Station.
Fluid Station Power Supply Cable (PS)	Used to provide power to the Wall Mount Fluid Station.
Applicator Handling: use Air Flow Switch (AFS) or Gun Flush Box (GFB)	Air Flow Switch: The air flow switch detects air flow to the gun and signals the ProMix controller when the gun is being triggered. The switch functions with the flow meters to ensure that the system components are functioning correctly. See the system operation manual for further information. Gun Flush Box: The gun flush box kit provides an automated flushing system for manual spray guns, and includes an air flow switch.

Location

Location Requirements

						
Do not substitute or modify system components as this may impair intrinsic safety. For installation, maintenance or operation instructions, read instruction manuals. Do not install equipment approved only for non-hazardous location in a hazardous area. See the identification label (FIG. 1) on the EasyKey or fluid station for the intrinsic safety rating for your model.						

- Mount EasyKey and Fluid Station within 50 ft (15.2 m) of each other, using 15U533 cable.

NOTE: An optional 15V213 100 ft (30.5 m) cable is also available.

- EasyKey:** Install in the non-hazardous area at a convenient location for the operator to view and operate.
- Fluid Station:** Install according to requirements for Intrinsically Safe Installation (FIG. 3) and at a convenient location to connect to paint and solvent supplies.

NOTE: For an Intrinsically Safe Installation, the Fluid Station may be located inside or outside the hazardous location. Install according to appropriate electrical codes.

- Booth Control:** Install in the hazardous area at a convenient location for the operator to view and operate. Mount using the wall bracket (see page 33).

Intrinsically Safe Installation Requirements

See FIG. 3 on page 13.

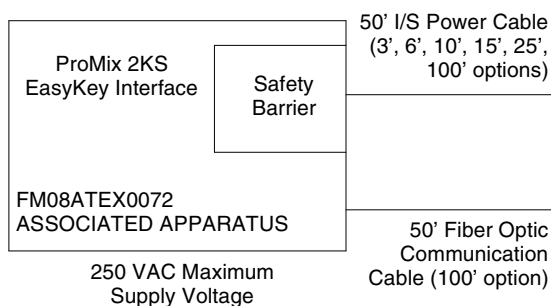
- The non-intrinsically safe terminals (power rail) must not be connected to any device which uses or generates more than 250 Vrms or dc unless it has been determined that the voltage has been adequately isolated.
- The installation must meet the requirements of the National Electric Code, Canadian Electrical Code Part I, NFPA 70, Article 504 Resp., Article 505 and ANSI/ISA 12.06.01.
- Multiple earthing of components is allowed only if high integrity equipotential system is realized between the points of bonding.
- Do not operate system with safety barrier cover removed.
- For ATEX, install per EN 60079-14 and applicable local and national codes.
- For power connection to Coriolis: Install Coriolis flow meters as explosion proof (USA, Canada)/flameproof Ex d (ATEX) per the manufacturer's installation instructions and applicable codes.
- For signal to 2KS: Terminals 24 and 25 of optional Endress+Hauser Coriolis flow meters installed using intrinsically safe wiring methods.
- For ATEX installations, interconnecting cabling specified is Type A cable in accordance with EN 60079-14.

Optional Cables

Optional CAN cables and fiber optic cables are available from Graco. See the ProMix 2KS Repair-Parts manual for available part numbers and lengths.

FM08ATEX0074 SYSTEM ASSEMBLY CERTIFICATE

NON-HAZARDOUS LOCATION ONLY



NOTE: See **Intrinsically Safe Installation Requirements** on page 12.

WARNING: Substitution of components may impair intrinsic safety. For installation, maintenance or operation instructions, see instruction manual.

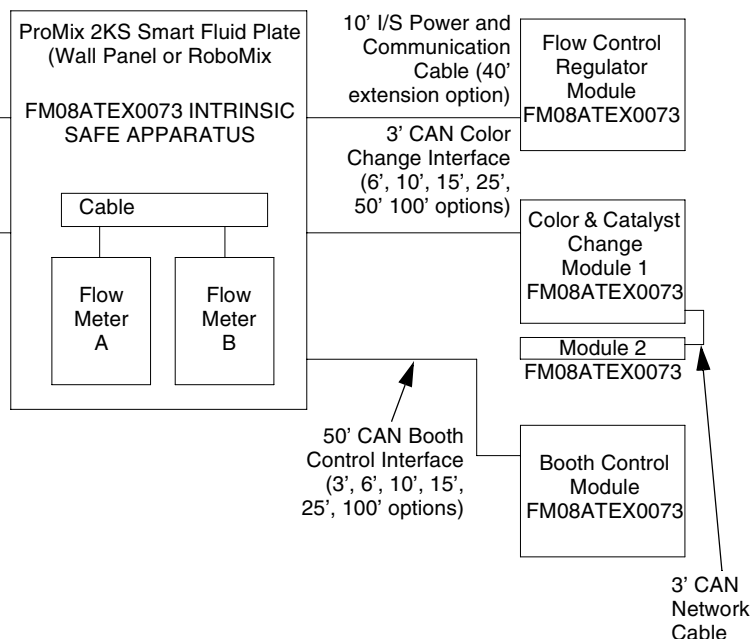
ADVERTISSEMENT: La substitution de composants peut compromettre la securite intrinseque.

HAZARDOUS (CLASSIFIED) LOCATION

CLASS I, DIV I, GROUP D, T3 (US AND CANADA)

CLASS I, ZONE I GROUP IIA T3 (ATEX ONLY)

TAUB = -20°C TO 50°C



Coriolis Meter Options, DMT 00 ATEX E 074 X (No exceptions):

Size	Graco P/N	Endress+Hauser P/N
1/8"	15T633*	80A-04-A-SVW-9-A-N-A-B-B-A-S
3/8"	15T634*	801-08-A-999-9-A-N-A-B-B-A-S
1/8"	16M510*	8CN04-84S89AABA9AC
1/4"	16M519*	8CN06-84S89AABA9AC

Power			
EasyKey +24 Vdc Common			Meter Terminal Block #
			1 2
Signal			
Fluid Plate Board	J3 Terminal		Meter Terminal Block #
Meter Position	A	B	
Signal	3	6	24
Common	2	5	25

* For P/N 15T633 order Coriolis Meter Kit 15V806.
 For P/N 15T634 order Coriolis Meter Kit 258151.
 For P/N 16M510 order Coriolis Meter Kit 24M260.
 For P/N 16M519 order Coriolis Meter Kit 24M261.

IS Control Drawing 289833

FIG. 3. Intrinsically Safe Installation

General Information

- Reference numbers and letters in parentheses in the text refer to numbers and letters in the illustrations.
- FIG. 2, page 10, shows the basic components of a manual system. Contact your Graco distributor for actual system designs.
- Be sure all accessories are adequately sized and pressure-rated to meet system requirements.
- There must be a shutoff valve between each fluid supply line and the ProMix system.
- A 100 mesh minimum fluid filter must be installed on component A and B fluid supply lines.
- To protect the EasyKey screens from paints and solvents, clear-plastic protective shields are available in packs of 10 (Part No. 197902). Clean the screens with a dry cloth if necessary.

Wall Mounting

1. See **Dimensions and Mounting Hole Layouts**, page 32.
2. Ensure that the wall and mounting hardware are strong enough to support the weight of the equipment, fluid, hoses, and stress caused during operation.
3. Using the equipment as a template, mark the mounting holes on the wall at a convenient height for the operator and so equipment is easily accessible for maintenance.
4. Drill mounting holes in the wall. Install anchors as needed.
5. Bolt equipment securely.

Air Supply

Requirements

- **Compressed air supply pressure:** 75-100 psi (517-700 kPa, 5.2-7 bar).
- **Air hoses:** use grounded hoses that are correctly sized for your system.

						
Trapped air can cause a pump or dispense valve to cycle unexpectedly, which could result in serious injury from splashing or moving parts. Use bleed-type shutoff valves.						

- **Air regulator and bleed-type shutoff valve:** include in each air line to fluid supply equipment. Install an additional shutoff valve upstream of all air line accessories to isolate them for servicing.
- **Air line filter:** a 10 micron or better air filter is recommended to filter oil and water out of the air supply and help avoid paint contamination and clogged solenoids. See FIG. 2.

Air Connections

See the **System Pneumatic Schematic** on page 29.

1. Tighten all ProMix system air and fluid line connections as they may have loosened during shipment.
2. Install a bleed-type air shutoff valve into the control air filter inlet on Wall Mount Fluid Station. FIG. 4.

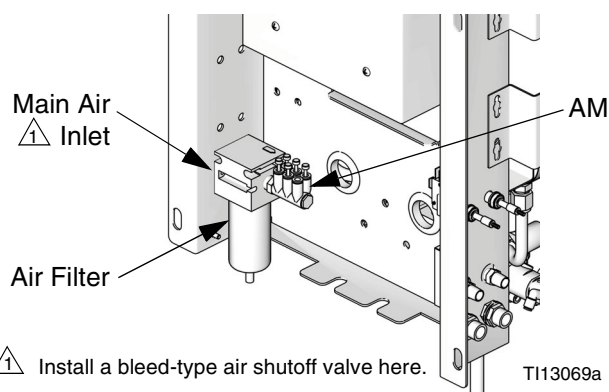


FIG. 4. Wall Mount Air Supply Inlet

3. Connect a clean, dry, main air supply line to the bleed-type air shutoff valve at the main air inlet. This air line supplies air to operate the gun, solenoids, and dispense valves.

NOTE: See **Technical Data** on page 41 for additional air supply/consumption information.

4. Install a bleed-type shutoff valve into the air purge valve line.
5. See FIG. 5. Install the supplied elbow (E), check valve (CV), and tube fitting (F) at the inlet of the air purge valve (APV). Use the 25 ft (7.6 m), 1/4 in. (6 mm) OD purge air tubing (AT, supplied) to connect a clean, dry air supply to the fitting (F) at the air purge valve inlet. Install filters/dryers as needed.

NOTICE

Use a separate purge air supply line for the air purge valve (APV). Do not connect the air purge valve to the unit's main air supply or to the air manifold (AM, FIG. 4), to avoid contaminating the solenoids, air logic lines, or unit's main air supply with fluid if the air purge valve (APV) and check valve (CV) fail.

Do not shorten the 25 ft (7.6 m), 1/4 in. (6 mm) OD purge air tubing (AT). Check daily for any visible solvent accumulation. Notify your supervisor if solvent is present.

2. Purge air line (AT) must be a separate air supply, connected to the check valve (CV). Do not connect the purge air line to the unit's main air supply or to the air manifold.

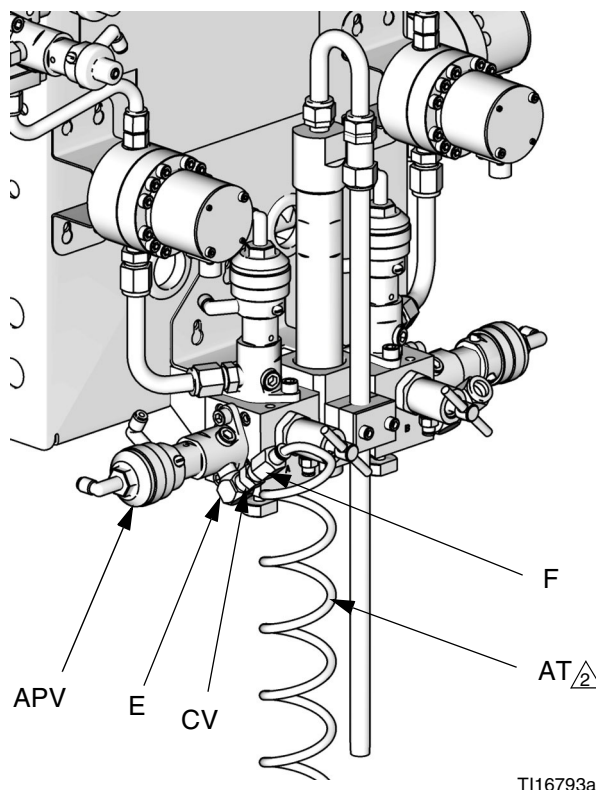


FIG. 5. Purge Air Supply Tube and Check Valve

NOTICE

The ProMix potlife timer will not function properly when used with multiple guns operating simultaneously. To avoid having mixed material set in the equipment, carefully monitor potlife by some other means.

If using a Graco electrostatic PRO™ Gun, a shutoff valve must be installed in the gun air line to shutoff the atomizing and turbine air to the gun. Contact your Graco distributor for information on air shutoff valves for electrostatic applications.						

Fluid Supply

Requirements

						
Do not exceed the pressure rating of the lowest rated component. See the identification label (FIG. 1 on page 4).						

						
To reduce the risk of injury, including fluid injection, you must install a shutoff valve between each fluid supply line and the fluid manifold assembly. Use the valves to shut off fluid during maintenance and service.						

ProMix models are available to operate air spray or air-assisted systems with a capacity of up to 3800 cc/min.

- Fluid supply pressure tanks, feed pumps, or circulating systems can be used.
- Materials can be transferred from their original containers or from a central paint recirculating line.
- For an airless system, the user must supply a gun trigger signal to the ProMix 2KS.
- See manual 313599 for Coriolis meter installation and operation instructions.
- If you are using dynamic dosing, see **Fluid Connections** at right and also see **Setup the Fluid Manifold for Dynamic Dosing** on page 18.

NOTE: The fluid supply must be free of pressure spikes, which are commonly caused by pump stroke change-over. If necessary, install pressure regulators or a surge tank on the ProMix fluid inlets to reduce pulsation. Contact your Graco distributor for additional information.

Fluid Connections

1. Connect the solvent supply lines.
 - a. Connect the solvent supply line to the 1/4 npt(f) solvent purge valve inlet. See FIG. 6.
 - b. **Multiple color system:** also connect a solvent supply line to the color change stack (Q), top valve 4 or 5. See FIG. 7.

NOTE: Solvent supplied by a single source can cause cross contamination and damage to the system. Install check valves or use separated solvent sources.

2. Connect the component A supply line(s).
 - ➔ **Single color system:** connect component supply line to the component A flow meter inlet.
 - ➔ **Multiple color system:** connect component A supply lines to the color change valve stack (S) inlets. See FIG. 7. The color number is marked on the valve air supply line.

NOTE: Paint Recirculating System Only

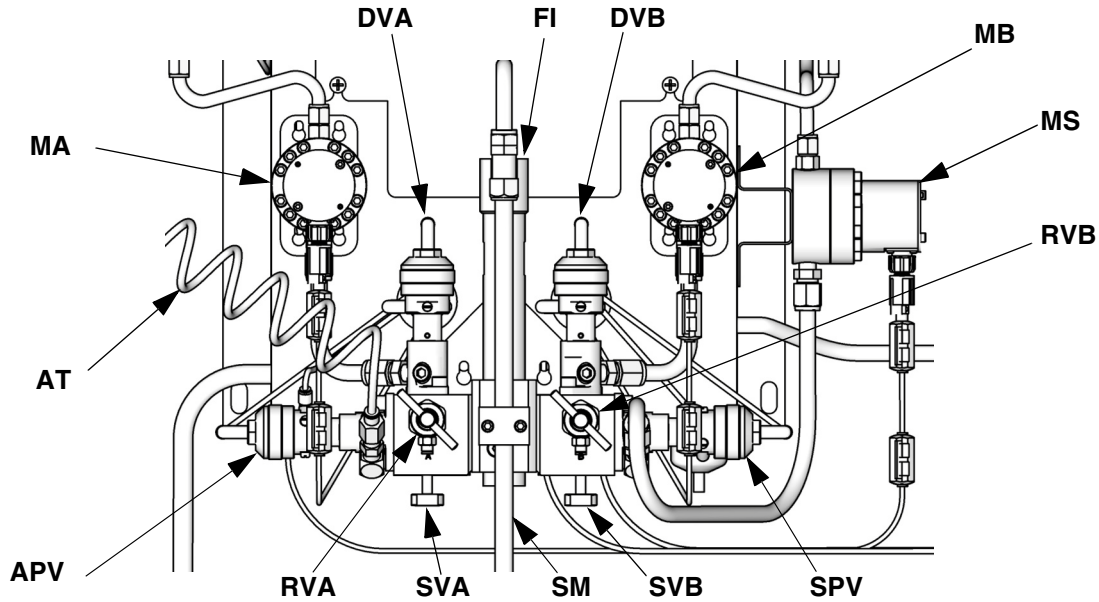
- The color change valves have two fluid ports for each individual valve. If you are recirculating paint, plumb the valves in one port and out the other.
- Another option is to use a tee fitting to recirculate.

NOTE: Verify that all unused fluid ports on the color change valve stack are plugged before operation. An open port will leak fluid.

3. Connect the component B line to the component B flow meter inlet.

NOTE: The component A and B fluid meter inlets have fluid check valves to prevent backflow from fluid supply pressure fluctuations. Backflow can cause ratio inaccuracies.

4. Connect the gun fluid supply line between the fluid manifold static mixer outlet and the gun fluid inlet.



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Key:

MA Component A Meter
DVA Component A Dose Valve
RVA Component A Sampling Valve
SVA Component A Shutoff Valve
MB Component B Meter
DVB Component B Dose Valve
RVB Component B Sampling Valve

SVB Component B Shutoff Valve
MS Solvent Meter (accessory)
SPV Solvent Purge Valve
APV Air Purge Valve
SM Static Mixer
FI Fluid Integrator
AT Air Purge Valve Air Supply Tube

FIG. 6. Wall Mount Fluid Station, Sequential Dosing

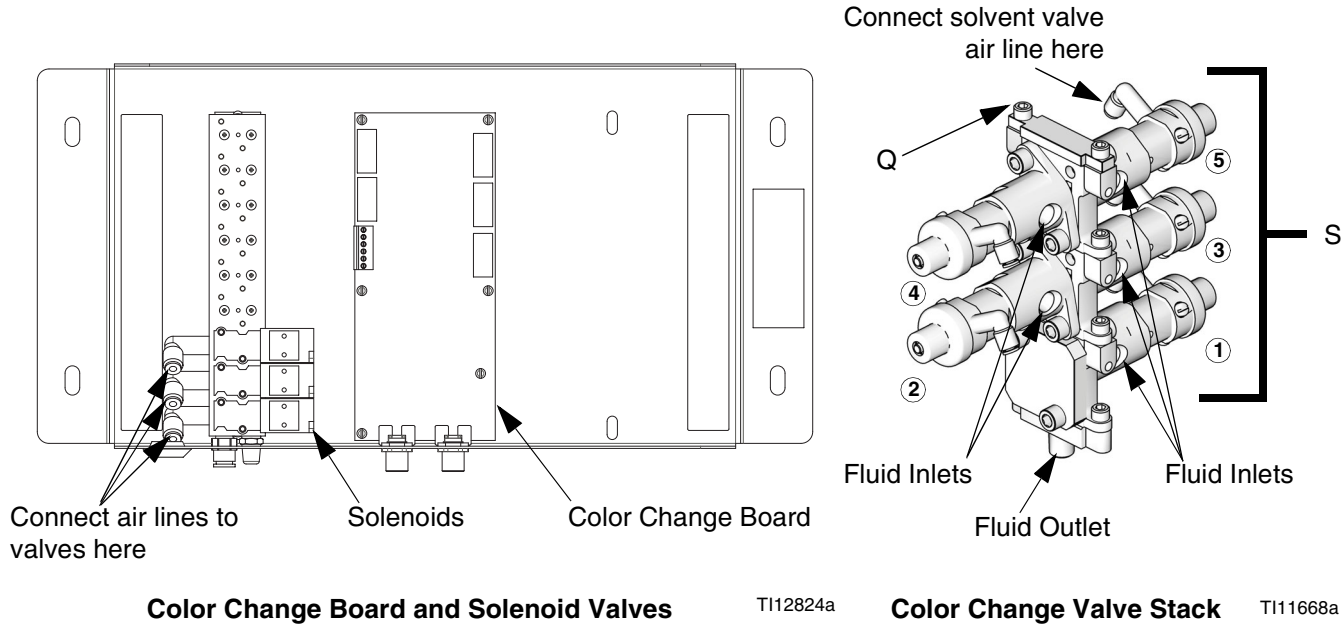
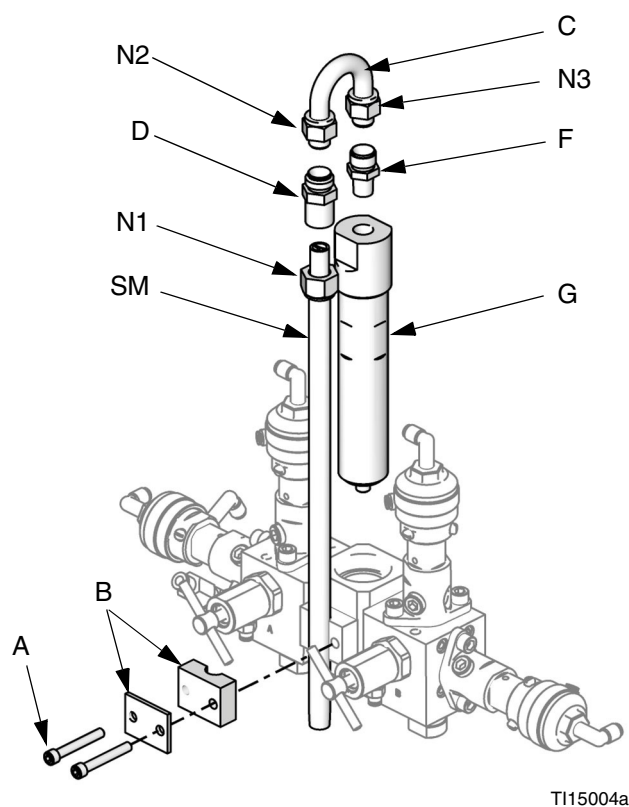


FIG. 7. Color Change Valves Air and Fluid Connections

Setup the Fluid Manifold for Dynamic Dosing

If you will be operating using dynamic dosing, the fluid manifold must be setup properly for your application. Order the 15U955 Injection Kit (accessory).

1. Remove the screws (A) and static mixer bracket assembly (B). See FIG. 8.
2. Loosen the static mixer nut (N1). Remove and retain the static mixer (SM).
3. Loosen the u-tube nuts (N2 and N3). Discard the u-tube (C) and the static mixer fitting (D).
4. Remove and retain the 1/4 npt(m) fitting (F). Remove the integrator (G) and discard.

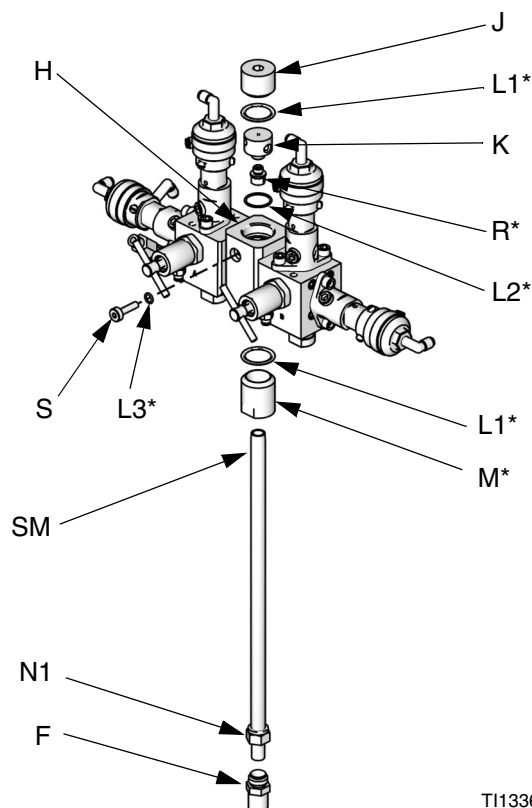


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FIG. 8. Disassemble Integrator and Static Mixer

5. See FIG. 9. Remove the remaining parts from the restrictor housing (H). Retain the plug (J) and base (K). Discard all the used o-rings,
6. Rotate the restrictor housing (H) 180° so the set-screw (S) is at top left, as shown in FIG. 9. Remove and retain the two setscrews (S). Discard the o-rings (L3). The position of these screws will be reversed when reassembled.
7. Install one larger o-ring (L1*) in the housing (H). Screw the injection cap (M*) into the housing.
8. Determine the desired flow range for your application. Select the appropriate size restrictor for your selected flow and ratio, using the **Dynamic Dosing Restrictor Selection Graphs** on pages 34-39 as a guide. Install the restrictor (R*) in the base (K).
9. Assemble the smaller manifold o-ring (L2*), restrictor (R*) and base (K), one larger o-ring (L1*), and plug (J) as shown.

* These parts are included in the 15U955 Injection Kit.



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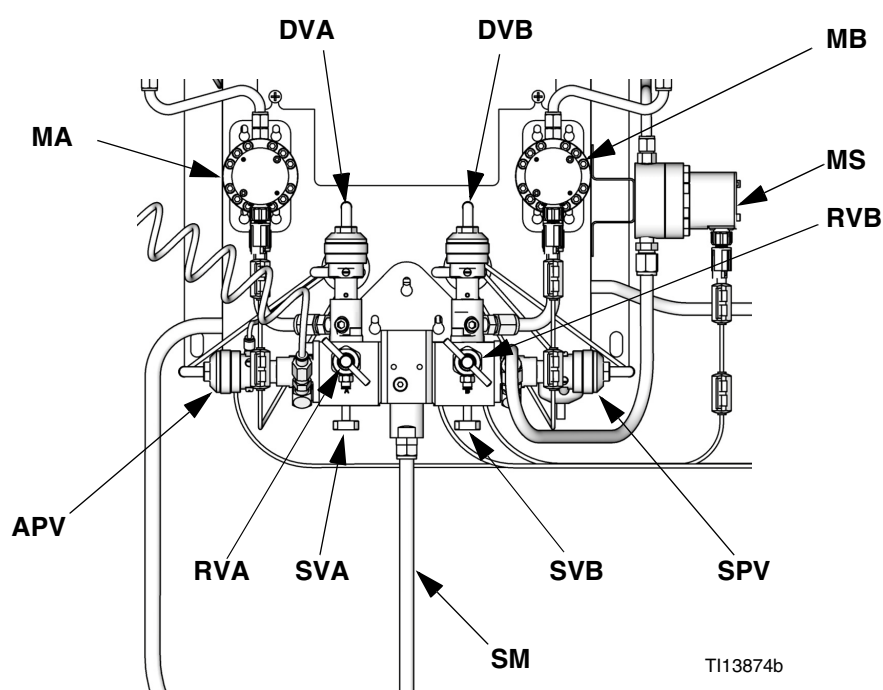
FIG. 9. Install 15U955 Injection Kit

10. Install the two setscrews and o-rings (L3*). Install the long setscrew (S) at the front of the housing, for ease of access.
11. Screw the static mixer (SM) into the injection cap (M*). Install the retained fitting (F) on the static mixer tube and secure with the nut (N1).
12. Follow instructions under **Fluid Connections** on page 16.

NOTE: Use a minimum 20 ft (6.1 m) x 1/4 in. (6 mm) ID gun fluid supply hose when using dynamic dosing. If the material is harder to integrate, use a longer hose.

13. Tune the fluid pressure and flow as explained in the ProMix 2KS Operation Manual.

NOTE: When using dynamic dosing it is very important to maintain a constant, well-regulated fluid supply. To obtain proper pressure control and minimize pump pulsation, install a fluid regulator on the A and B supply lines upstream of the meters. In systems with color change, install the regulator downstream of the color/catalyst valve stack.



Key:

MA	Component A Meter
DVA	Component A Dose Valve
RVA	Component A Sampling Valve
SVA	Component A Shutoff Valve
MB	Component B Meter
DVB	Component B Dose Valve
RVB	Component B Sampling Valve
SVB	Component B Shutoff Valve
MS	Solvent Meter (accessory)
SPV	Solvent Purge Valve
APV	Air Purge Valve
SM	Static Mixer

FIG. 10. Wall Mount Fluid Station, Dynamic Dosing

Solvent Meter Accessory

The ProMix 2KS Solvent Push feature requires installation of the accessory solvent meter (MS). Order Graco Part No. 280555 S3000 Solvent Meter Kit. See manual 308778.

NOTE: You must assemble the meter sensor to the meter body before connecting the cable to the sensor for the meter to function properly.

1. See FIG. 11. Install the solvent meter (MS) on the side of the fluid station, using the bracket and hardware provided with the meter. Connect the solvent meter cable (SMC) to Pins 1, 2, and 3 of J12 on the fluid panel control board. See the **System Electrical Schematic** on page 31. Connect the cable ground wire to the fluid station ground terminal.

2. Connect a solvent supply line (SS) from the outlet of the solvent meter (MS) to the inlet of the solvent purge valve (SPV).

NOTE: If you are using a 3rd purge valve instead of the solvent purge valve to run the Solvent Push feature, connect the solvent supply line from the solvent meter to the inlet of the 3rd purge valve.

3. Connect the main solvent supply to the inlet of the solvent meter (MS).

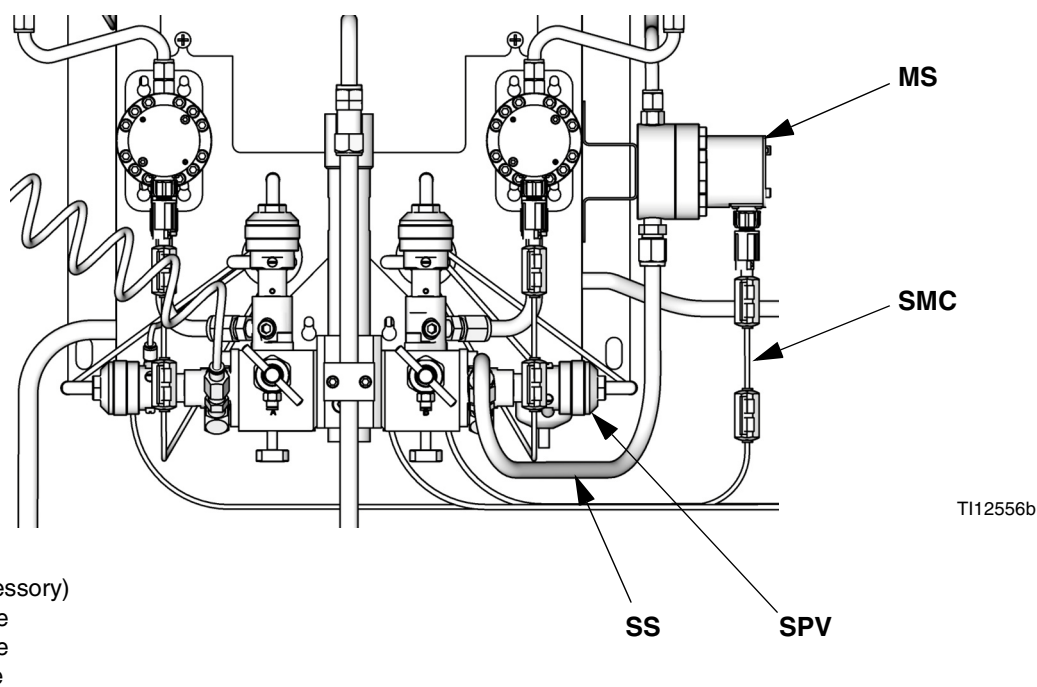


FIG. 11. Solvent Meter

Electrical

Requirements

All electrical wiring must be completed by a qualified electrician and comply with all local codes and regulations. Enclose all cables routed in the spray booth and high traffic areas in conduit to prevent damage from paint, solvent, and traffic.						

NOTE: All options ordered on the ProMix system are electrically tested at the factory.

The ProMix operates with 85-250 VAC, 50/60 Hz input power, with a maximum of 2 amp current draw. The power supply circuit must be protected with a 15 amp maximum circuit breaker.

Not included with system:

- Power supply cord compatible to your local power configuration. Wire gauge size must be 8-14 AWG.
- The input power access port is 22.4 mm (0.88 in.) diameter. It accepts a bulkhead strain relief fitting or conduit. See FIG. 13.

Connect Main Power

- Provide power to the EasyKey. Install a bulkhead strain relief or conduit bulkhead through the EasyKey port . See FIG. 13.
- See FIG. 12 and the **System Electrical Schematic** on page 30 for the L1, N, and ground wiring connections inside the EasyKey.
- Ground the EasyKey to a true earth ground. See **Grounding**, page 27.

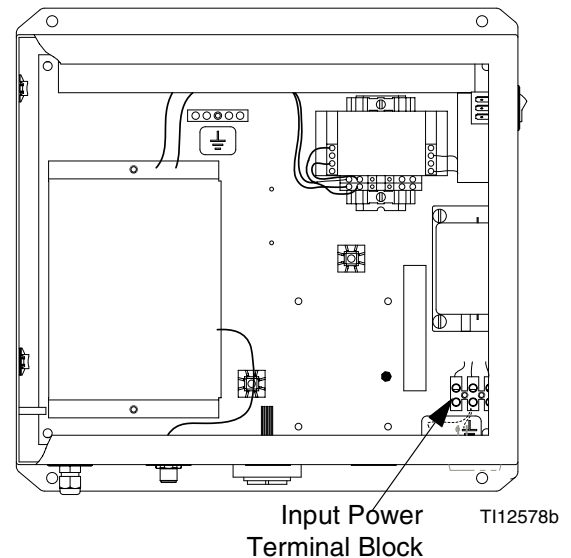


FIG. 12. Main Power Connection

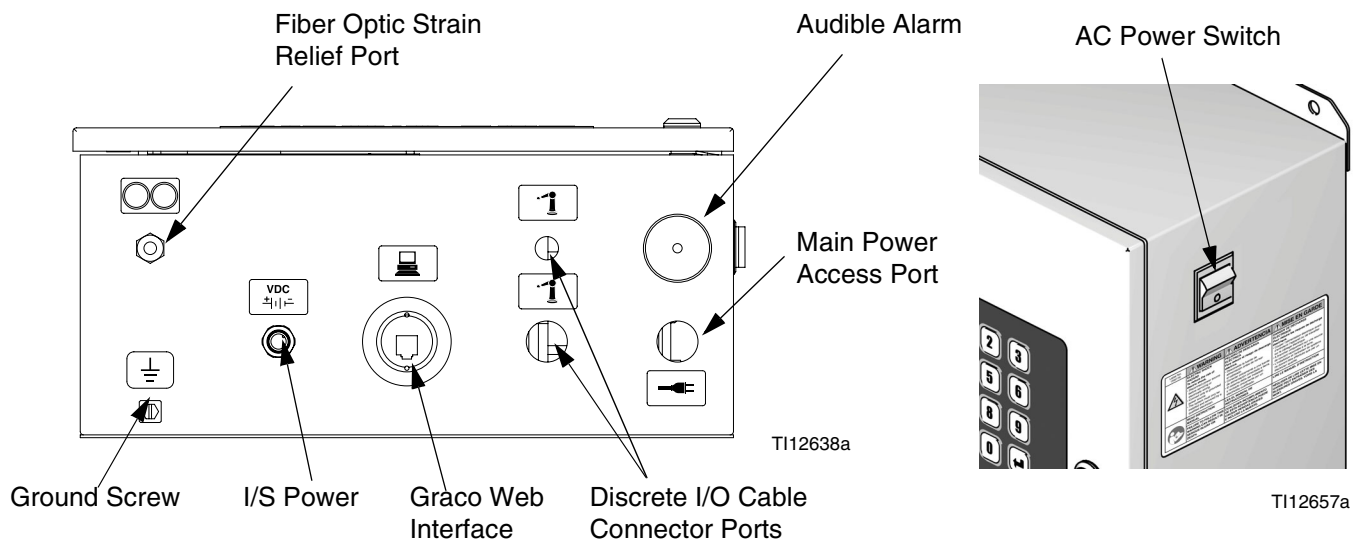


FIG. 13. EasyKey Connections and AC Power Switch

Connect EasyKey to Fluid Station Control

There are two 50 ft (15.2 m) cables to route between the EasyKey and Fluid Station Control: the Fluid Station Power Cable and the Fiber Optic Cable.

1. Connect the appropriate Fluid Station Power Cable end to the EasyKey connector . See FIG. 13.
2. Connect the other cable end to the Fluid Station Control connector  (J10). See FIG. 15.
3. The Fiber Optic Cable is shipped from the factory attached to the Fluid Station connector . See FIG. 13.

NOTE: If you need to detach the Fiber Optic Cable from the Fluid Station, note how the cable is routed inside the enclosure. Never cut the fiber optic cable. Cutting can damage the cable and will defeat the color-coded cable connections.

4. Route the opposite Fiber Optic Cable end through the Fluid Station strain relief connector . Do not route the cable with tight bends or kinks.

NOTE: The fiber optic cable has a minimum bend radius of 1.6 in. (40 mm).

5. Route the fiber optic cable end through the square adhesive backed tie holder. Connect the blue and black cable connectors to the matching connectors on the EasyKey circuit board. See FIG. 14. Insert the cable connectors until they bottom out (approximately ¼ in. [6 mm]), then tighten the threaded connector.

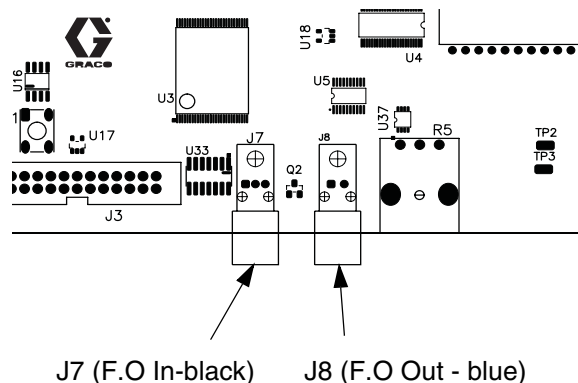


FIG. 14 EasyKey Circuit Board

NOTICE

To avoid cracking the circuit board, do not over-tighten or cause excessive stress on the circuit board connector.

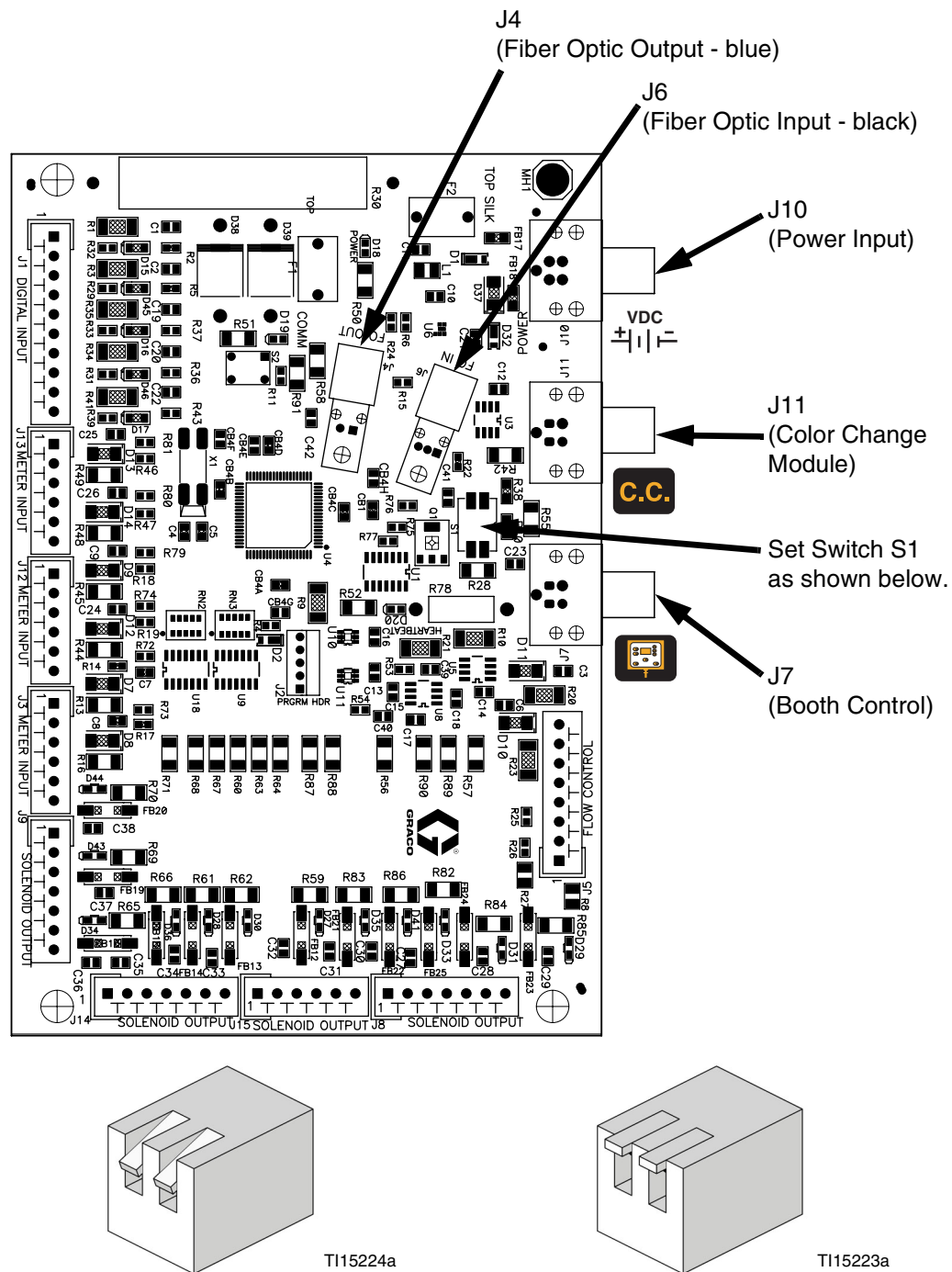
6. Tighten the strain relief connector .

Connect Booth Control to Fluid Station Control

Connect the cable from the Booth Control to the Fluid Station connector  (J7). See FIG. 15.

Fluid Station Control Board Switch Settings

On the 2KS fluid station control board, set switch S1 to ON (down) or OFF (up), as shown in FIG. 15.



**Set switch S1 to ON (down) if
system has Booth Control
OR Color Change, or neither.**

Set switch S1 to OFF (up) if system has Booth Control AND Color Change.

FIG. 15. Fluid Station Board Connections

Connect Color Change Module

To install the color change module(s), see manual 312787.

Connect a 5-pin electrical cable from the labeled connection port **C.C.** (J11) on the fluid station control board to the color change board. See FIG. 16.

If you are using two color change modules to add colors, connect a 5-pin electrical cable from the first color change board to the second color change board.

Set switches S3-S6 on the color change board(s) as shown in Table 2 and FIG. 16, depending on the number of color change boards and color change modules being used in your system.

For wiring between the color change board and the solenoids, see the color change module electrical schematic, FIG. 17.

Table 2: Color Change Board Switch Settings

Two Color Change Boards								
Color Change Board 1				Color Change Board 2				Effect on System
S3	S6	S5	S4	S3	S6	S5	S4	
Termination Resistor	Board ID	Catalyst On/Off	Color On/Off	Termination Resistor	Board ID	Catalyst On/Off	Color On/Off	
OFF	ON	ON	ON	ON	OFF	NOT USED		4 catalyst valves, 30 color valves
OFF	ON	OFF	ON	ON	OFF			0 catalyst valves, 30 color valves
One Color Change Board								
ON	ON	ON	ON	NOT PRESENT				4 catalyst valves, 12 color valves
ON	ON	ON	OFF					4 catalyst valves, 0 color valves
ON	ON	OFF	ON					0 catalyst valves, 12 color valves

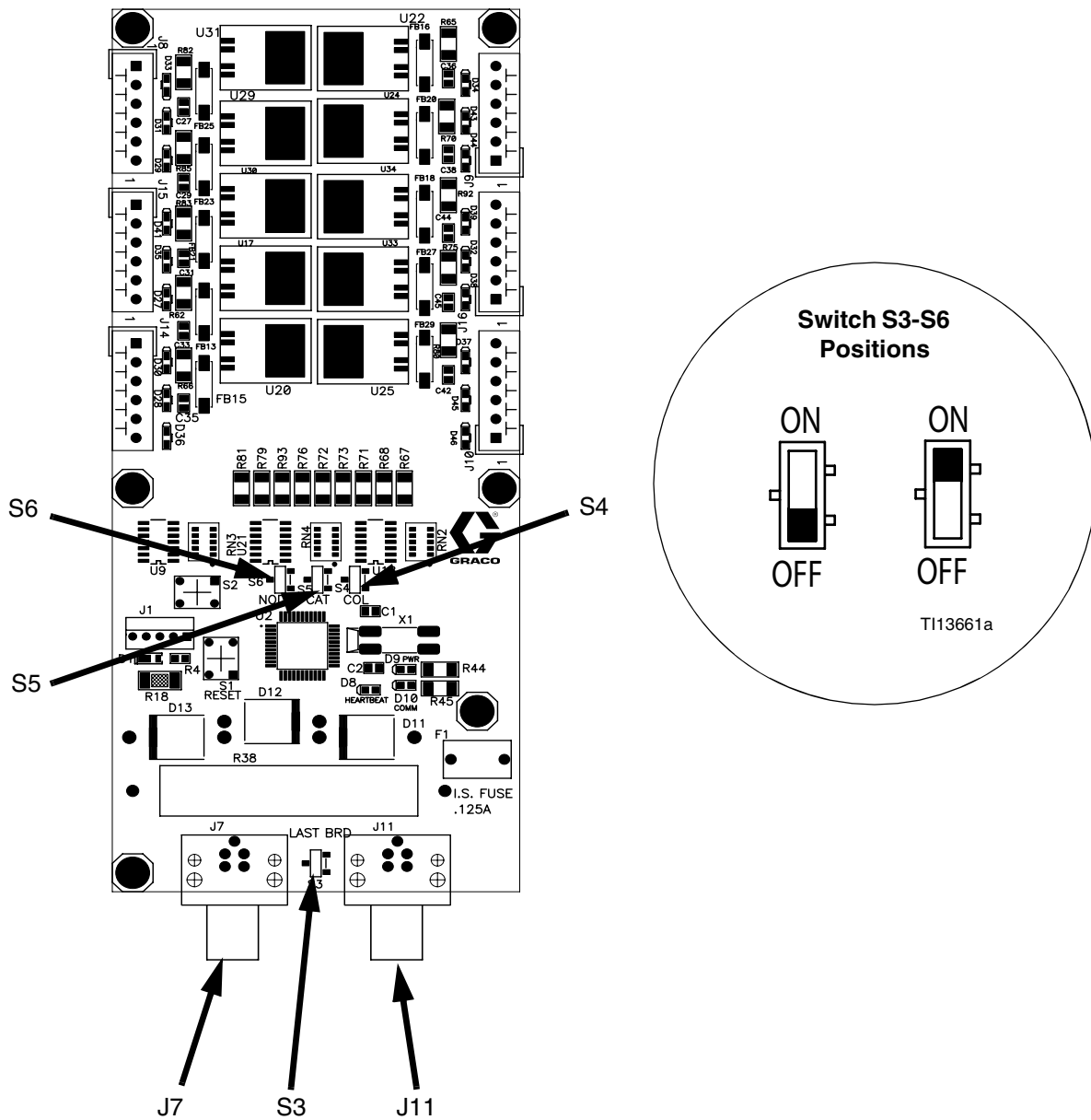


FIG. 16. Color Change Board Switches S3-S6

WIRING DIAGRAM

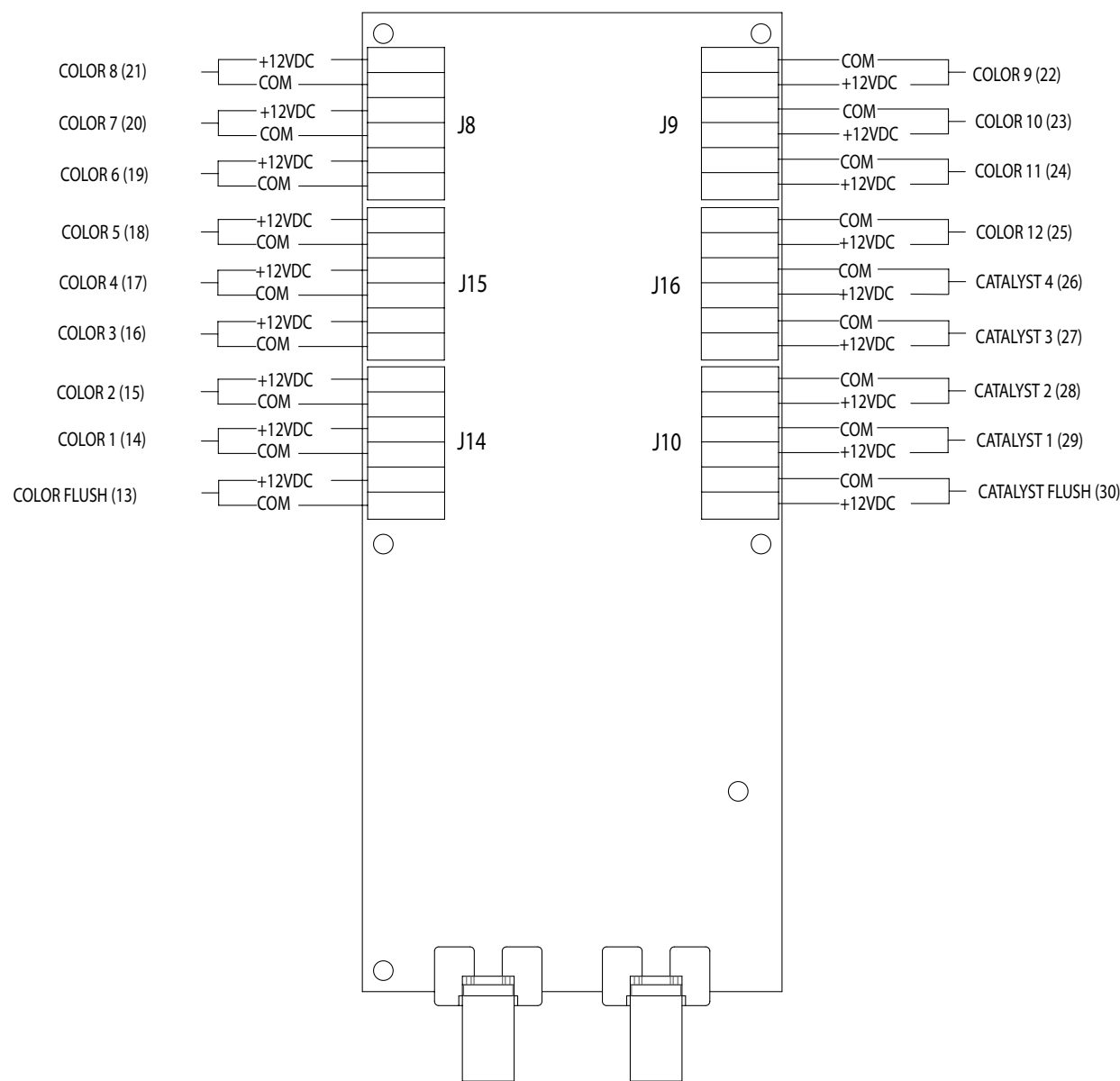


FIG. 17. Color Change Module Electrical Schematic

Grounding

						
Your system must be grounded. Read Warnings, page 7. For intrinsic safety, ground wires for the EasyKey, Fluid Station, Booth Control, and Gun Flush Box must all be connected to the same true earth ground. See FIG. 18, page 28.						

Ground the ProMix system as instructed here and in the individual component manuals. A ground wire and clamp, part no. 223547, is available from Graco.

NOTE: Different ground points (unequal potential) may cause current to flow through component cables, causing incorrect signals.

EasyKey

Connect a ground wire from the EasyKey ground screw to a true earth ground. FIG. 18.

Booth Control

The Booth Control is grounded through the power cable connection to the fluid station. FIG. 18.

Gun Flush Box

Connect a ground wire from the Gun Flush Box ground lug to a true earth ground. FIG. 18.

Wall Mount Fluid Station

Connect a ground wire from the Wall Mount Fluid Station ground screw to a true earth ground. FIG. 18.

Color Change Module

Connect a ground wire from the Color Change Module ground screw to a true earth ground. A ground wire and clamp, part no. 223547, is available from Graco. FIG. 18.

Flow Meters

Connect the meter cables as shown in the **System Electrical Schematic Hazardous Area** on page 31. Failure to properly connect the shield may cause incorrect signals.

Feed Pumps or Pressure Pots

Connect a ground wire and clamp from a true earth ground to the pumps or pots. See pump or pressure pot manual.

Air and Fluid Hoses

Use grounded hoses only.

Spray Gun

Follow the grounding instructions in your gun manual.

Fluid Supply Container

Follow local code.

Object Being Sprayed

Follow local code.

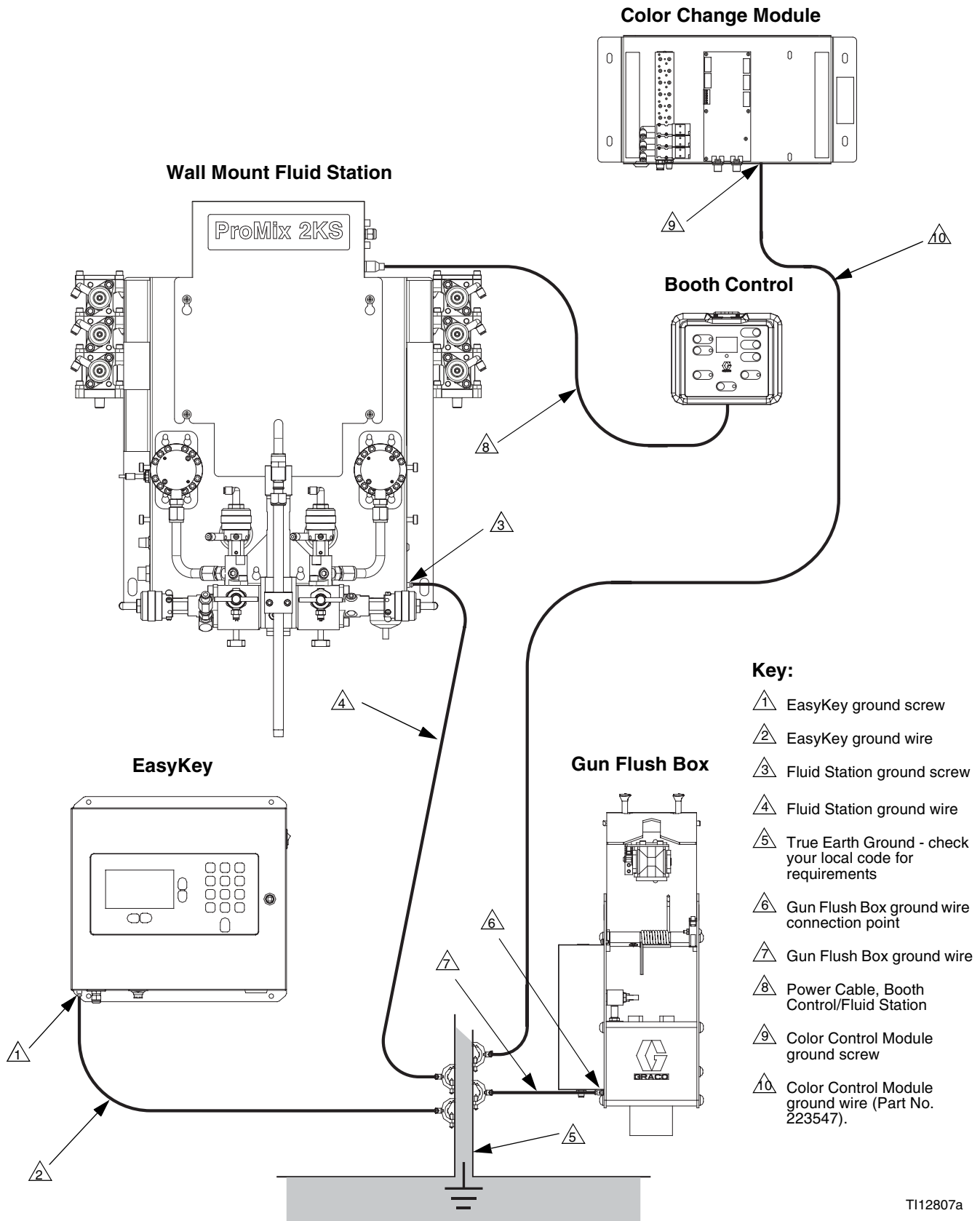
All Solvent Pails Used When Purging

Follow local code. Use only conductive metal pails/containers placed on a grounded surface. Do not place the pail/container on a nonconductive surface, such as paper or cardboard, which interrupts the grounding continuity.

Check Resistance

						
To ensure proper grounding, resistance between ProMix components and true earth ground must be less than 1 ohm. Read Warnings, page 7.						

Have a qualified electrician check resistance between each ProMix component and true earth ground. If resistance is greater than 1 ohm, a different ground site may be required. Do not operate the system until the problem is corrected.

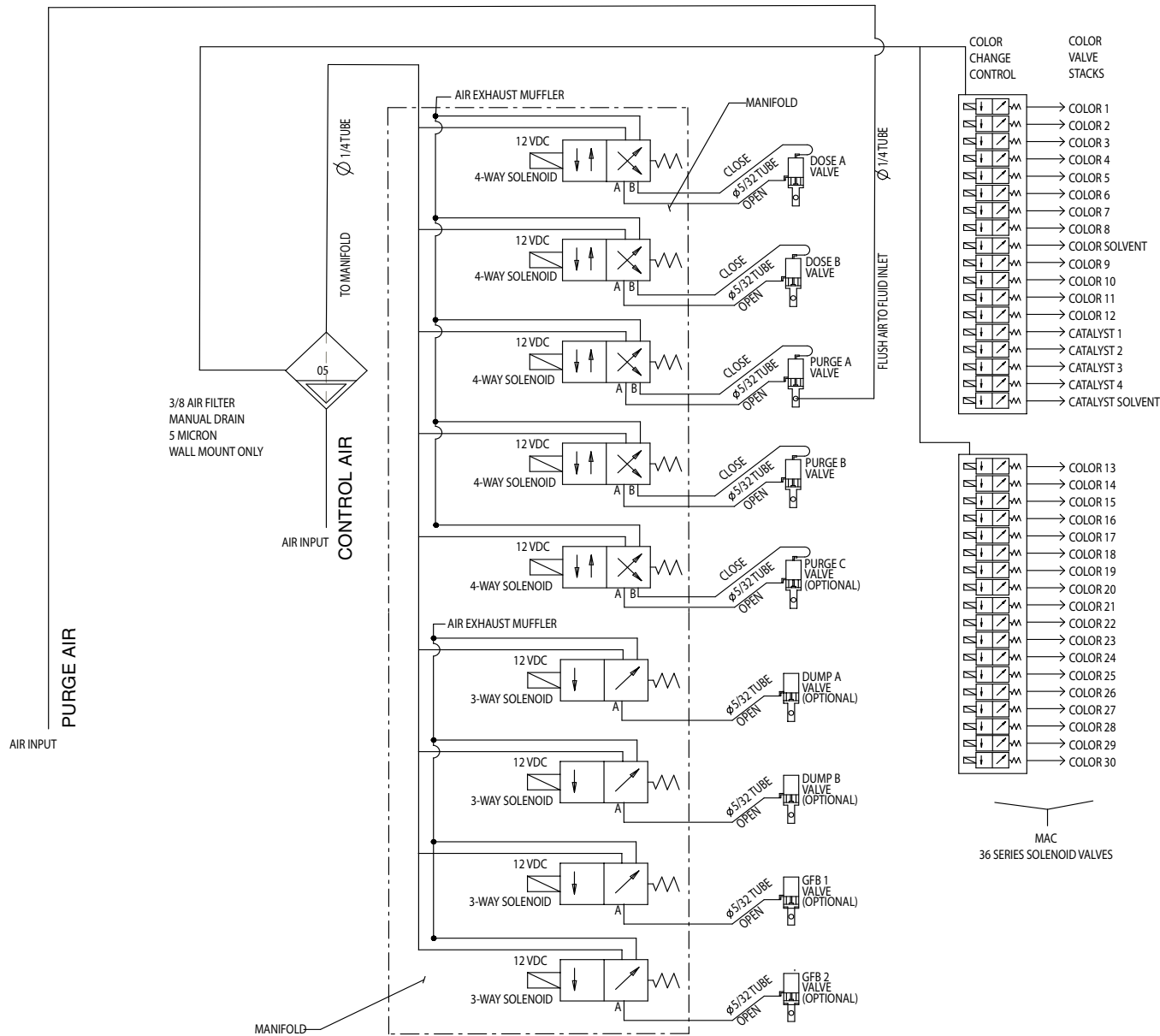


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FIG. 18: Grounding

Schematic Diagrams

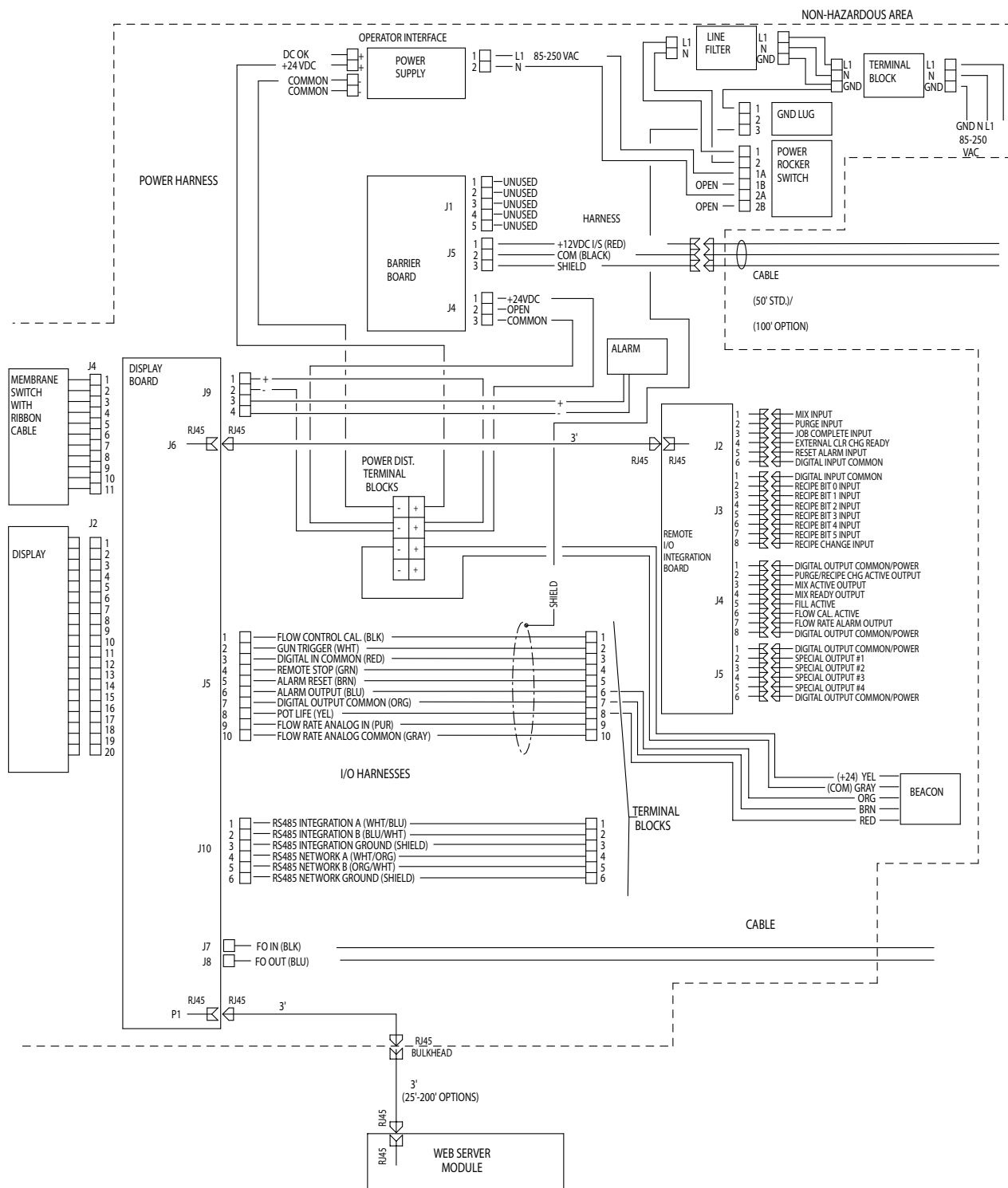
System Pneumatic Schematic



System Electrical Schematic

NOTE: The electrical schematic illustrates all possible wiring expansions in a ProMix 2KS system. Some components shown are not included with all systems.

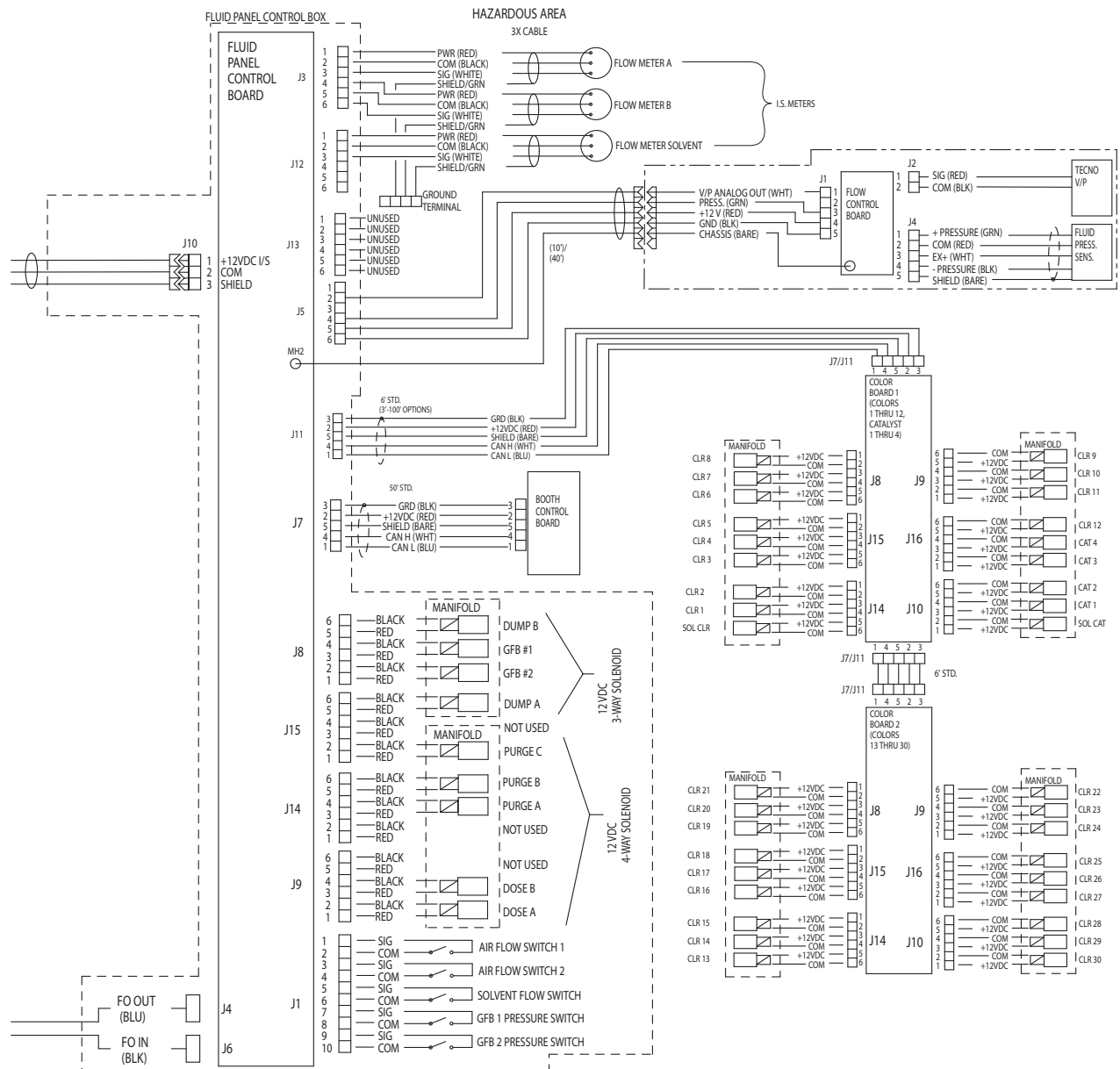
Non-Hazardous Area



System Electrical Schematic

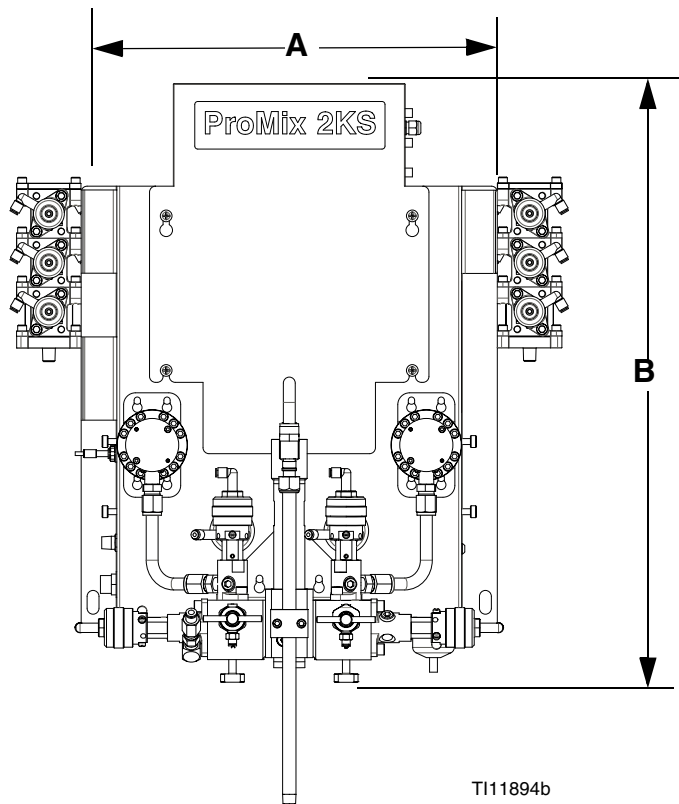
NOTE: The electrical schematic illustrates all possible wiring expansions in a ProMix 2KS system. Some components shown are not included with all systems.

Hazardous Area



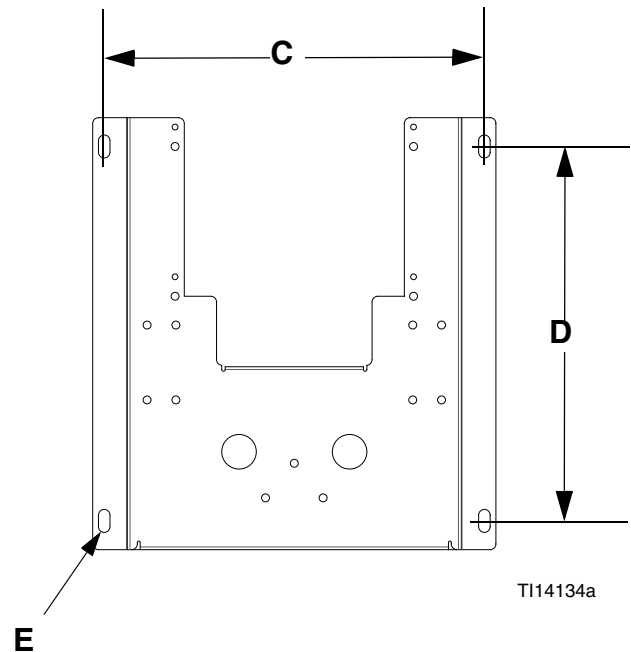
Dimensions and Mounting Hole Layouts

Wall Mount Fluid Station



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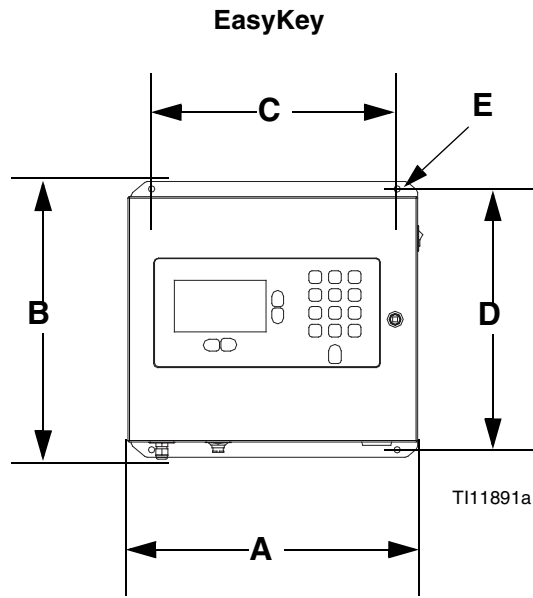
Mounting plate only shown, for clarity



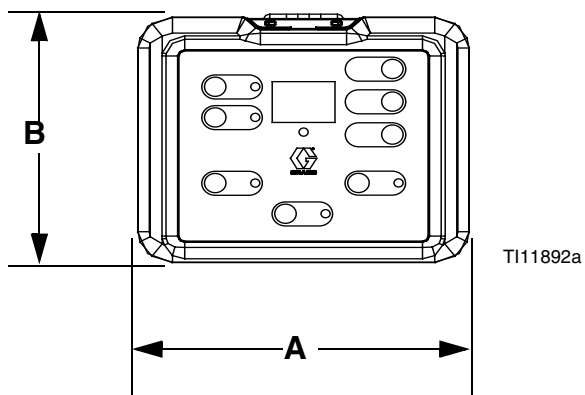
TI14134a

NOTE: Height is shown from top of panel to fluid shutoff valves, and does not include the effect of variable fluid integrator heights. Width of panel does not include optional color/catalyst valve stacks.

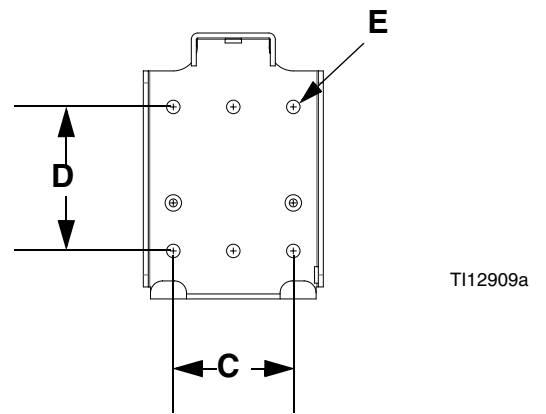
Module	A Overall Width in. (mm)	Overall Depth in. (mm)	B Overall Height in. (mm)	Mounting Dimensions, Width (C) x Height (D) in. (mm)	E Mounting Hole Size in. (mm)	Weight lb (kg)
EasyKey	14.0 (355.6)	6.6 (167.6)	13.5 (342.9)	12.0 x 12.75 (304.8 x 323.9)	0.3 (7.6)	22.2 (10.1)
Booth Control	7.2 (182.9)	3.0 (76.2)	6.0 (152.4)	none; see mounting bracket below	none	2 (0.91)
Booth Control Mounting Bracket	3.75 (95.3)	2.0 (50.8)	6.0 (152.4)	2.5 x 3.0 (63.5 x 76.2)	0.281 (7.14)	2 (0.91)
Wall Panel	17.5 (444.5)	11.0 (279.4)	27.0 (685.8)	16.5 x 16.25 (419.1 x 412.8)	0.5 (12.7)	50 (22.7)
Gun Flush Box	See Gun Flush Box manual 312784.					
Color Change Control Module	See Color Change Module manual 312787.					



Booth Control Module



Booth Control Bracket



Dynamic Dosing Restrictor Selection Graphs

Use the graphs on pages 35- 39 as a guide to determine the correct restrictor size for your desired flow and material viscosity. Table 3 lists the available restrictor sizes.

Example:

Application: air spray system with a 5:1 mix ratio

Fluid Supply: 1:1 pumps at 100 psi (7 bar, 0.7 MPa)

Flow Rate: 300 cc/min at the gun

Select the Restrictor Size: choose either the .040 or .070 orifice, to ensure that the pressure differential is not more than 10-20 psi (0.7-1.4 bar, .07-0.14 MPa), provided the fluid viscosities are similar to those tested.

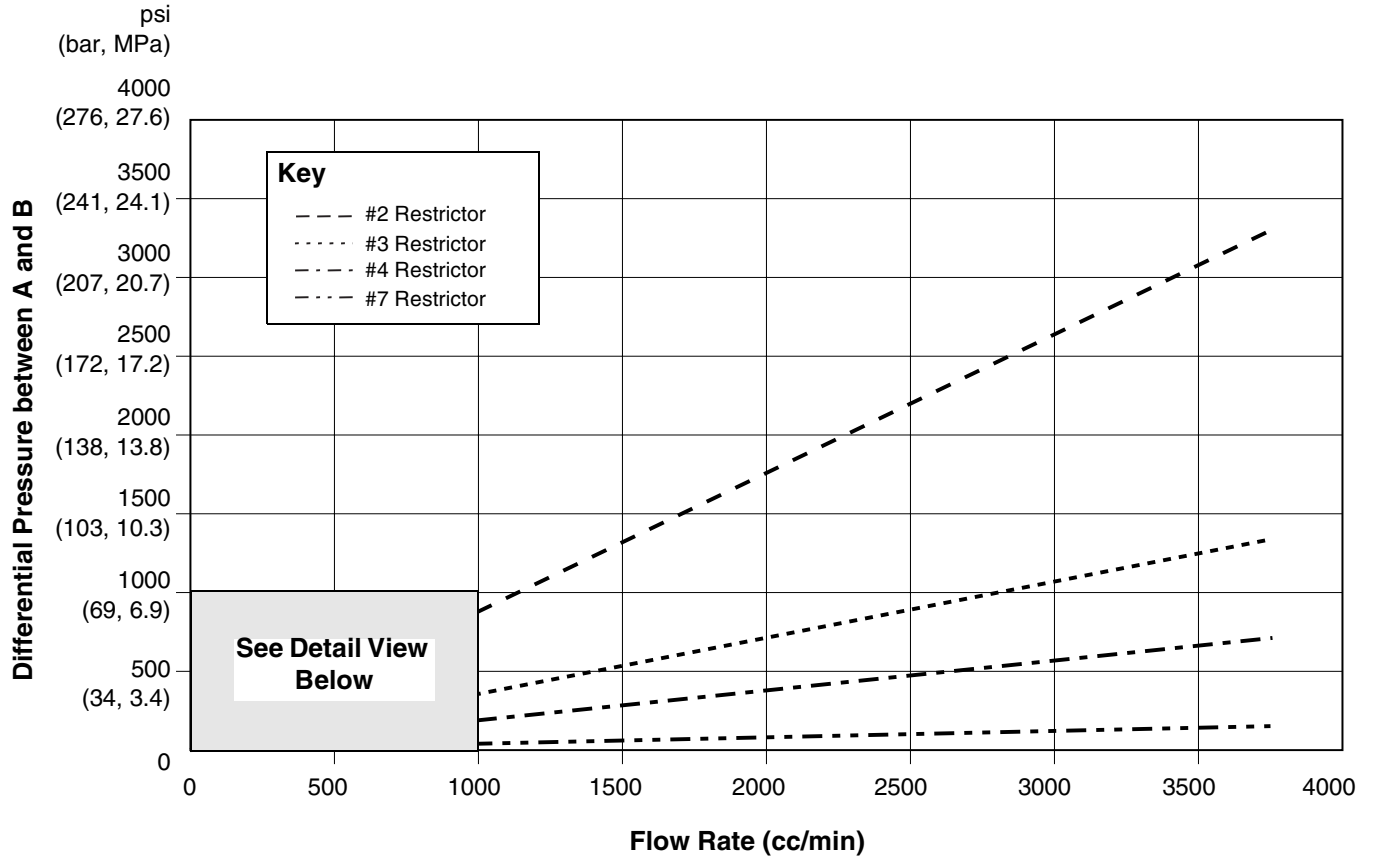
- If the viscosity of component B is lower than the viscosity of the chart used for selection you may need to use a smaller restrictor or decrease the pressure differential.
- If the viscosity of component B is higher than the viscosity of the chart used for selection you may need to use a larger restrictor or increase the pressure differential.
- In systems using an air-assisted gun, if the fluid pressure of component A is higher than the component A pressure from the charts you may need to use a larger restrictor or increase the pressure differential.

Table 3: Restrictor Sizes

Size Code	Orifice Size	Part No.
2*	.020	15U936
3*	.030	15U937
4*	.040	15U938
5✓	.050	15U939
6✓	.060	15U940
7*	.070	15U941
8✓	.080	16D554

* These restrictors are included in Injection Kit 15U955.

✓ These restrictors are optional sizes, not included in the Injection Kit.



Detail View

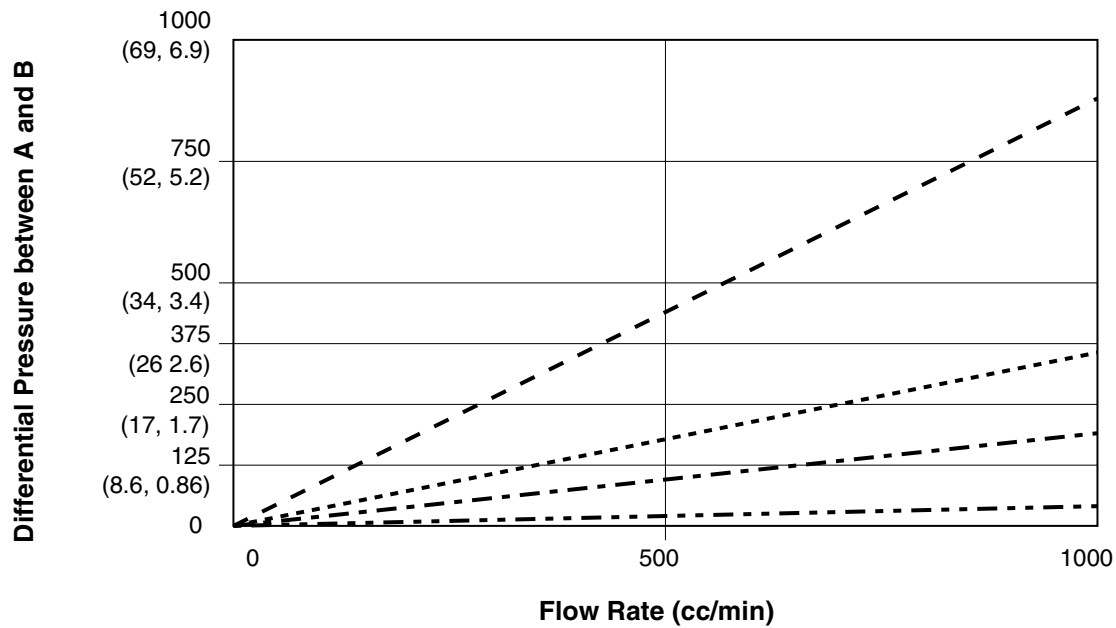


FIG. 19. Dynamic Dosing Performance (1:1 Ratio, 90 centipoise fluid, 100 psi A side pressure)

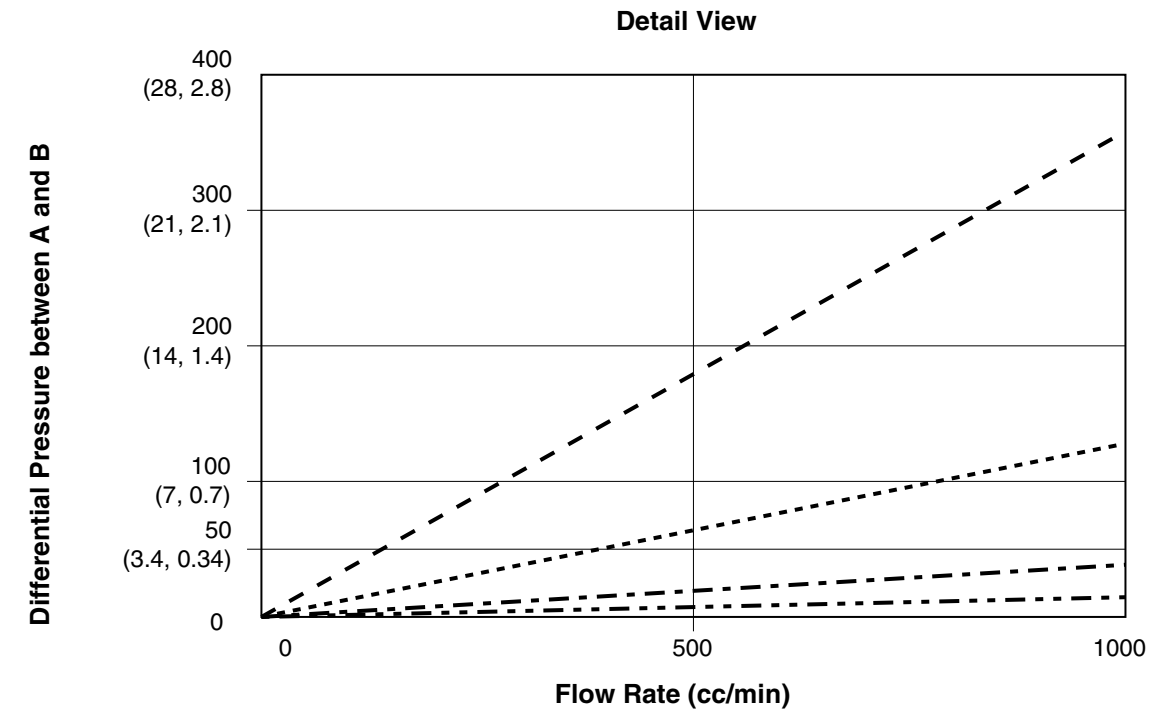
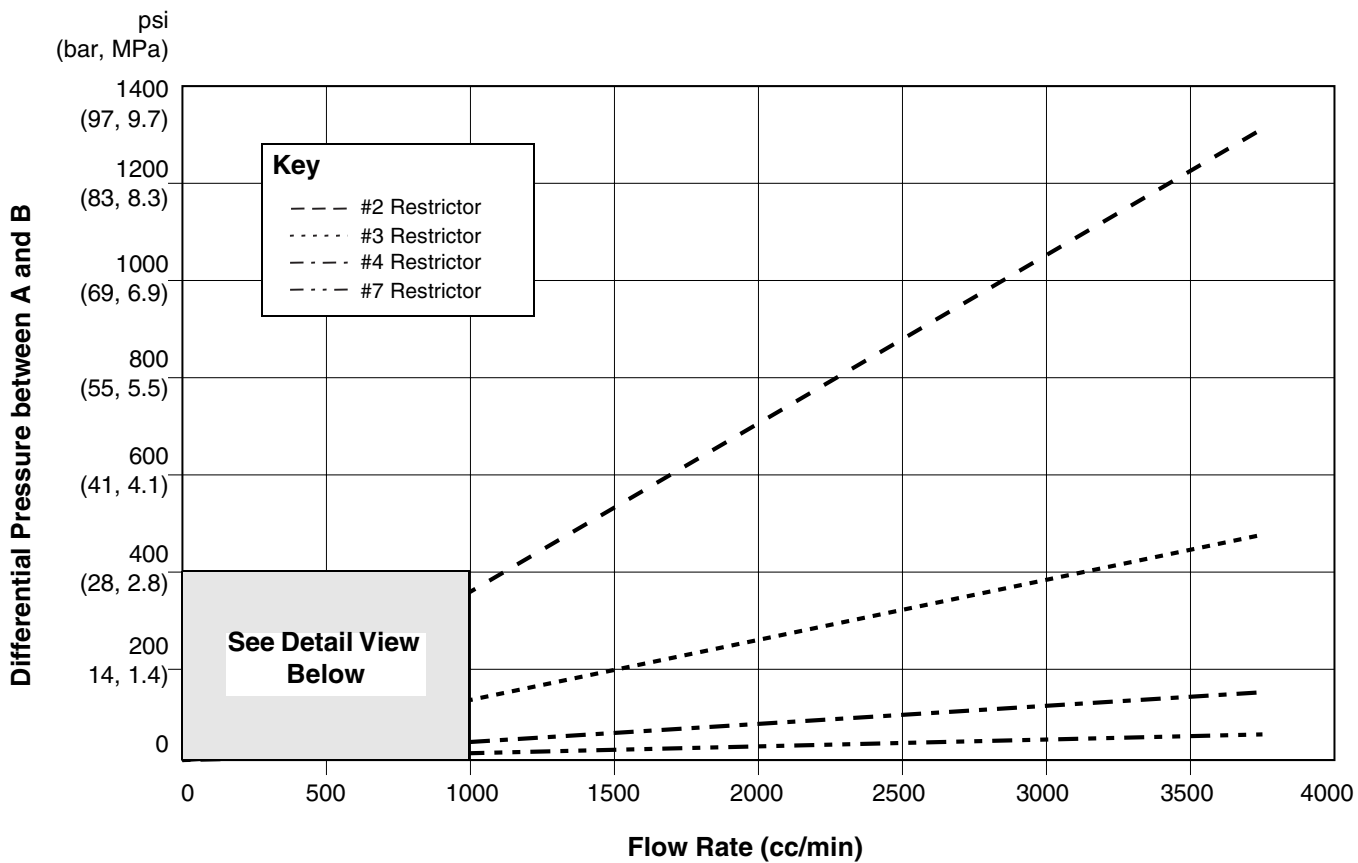


FIG. 20. Dynamic Dosing Performance (5:1 Ratio, 90 centipoise fluid, 100 psi A side pressure)

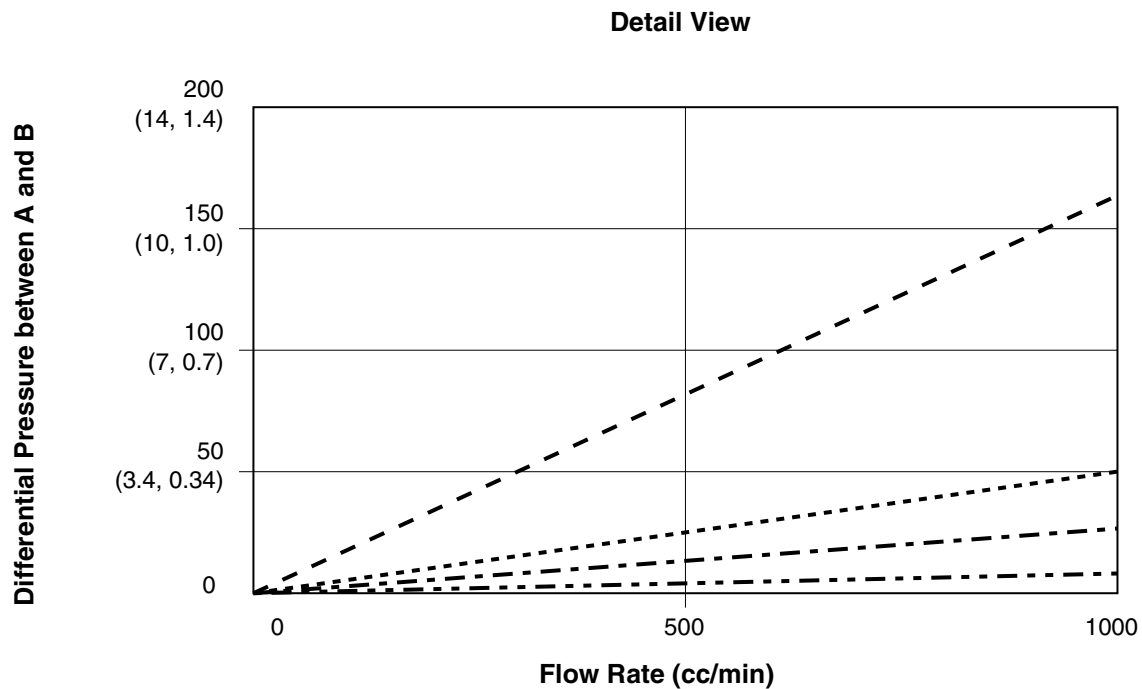
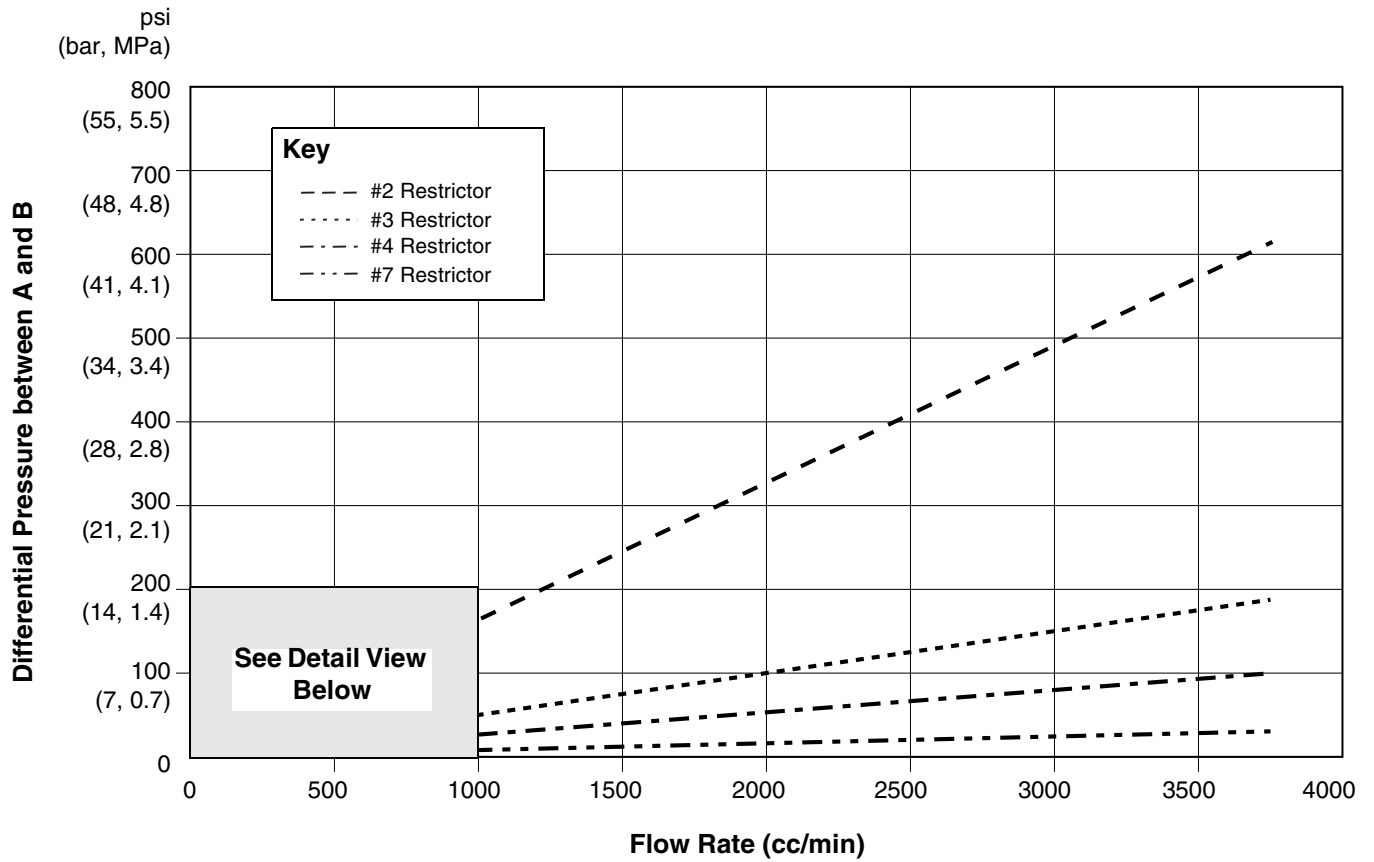


FIG. 21. Dynamic Dosing Performance (10:1 Ratio, 90 centipoise fluid, 100 psi A side pressure)

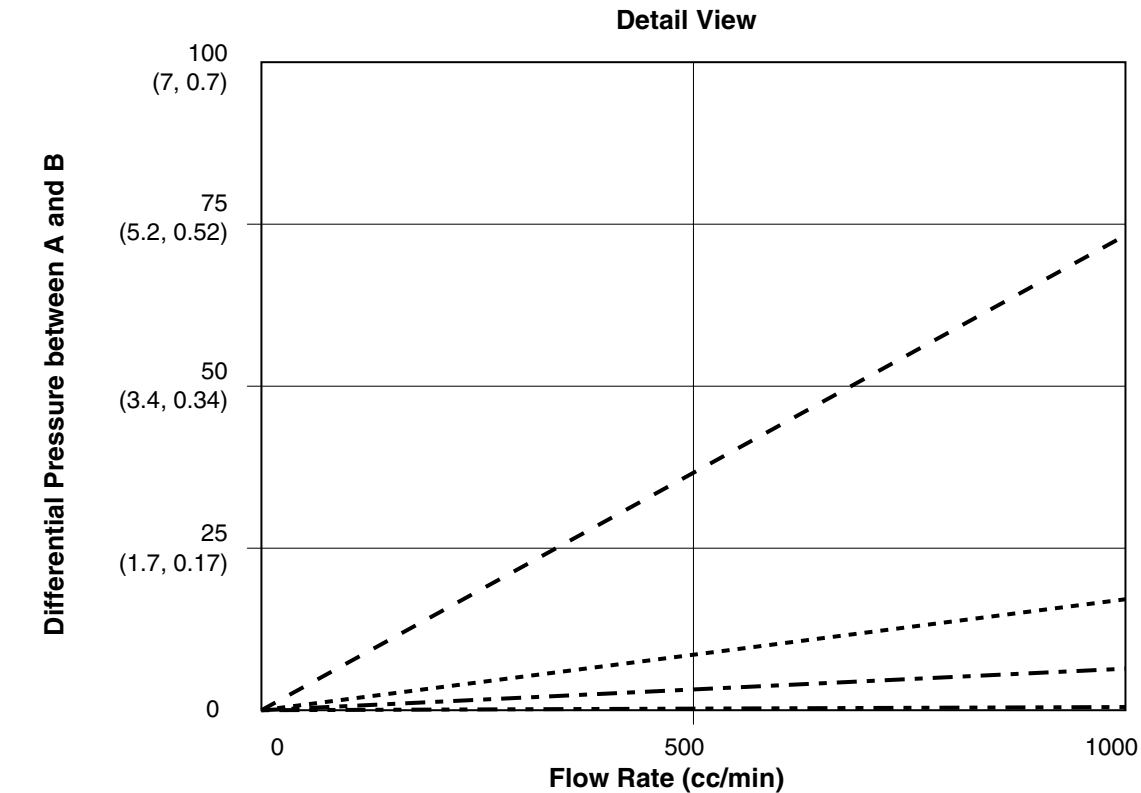
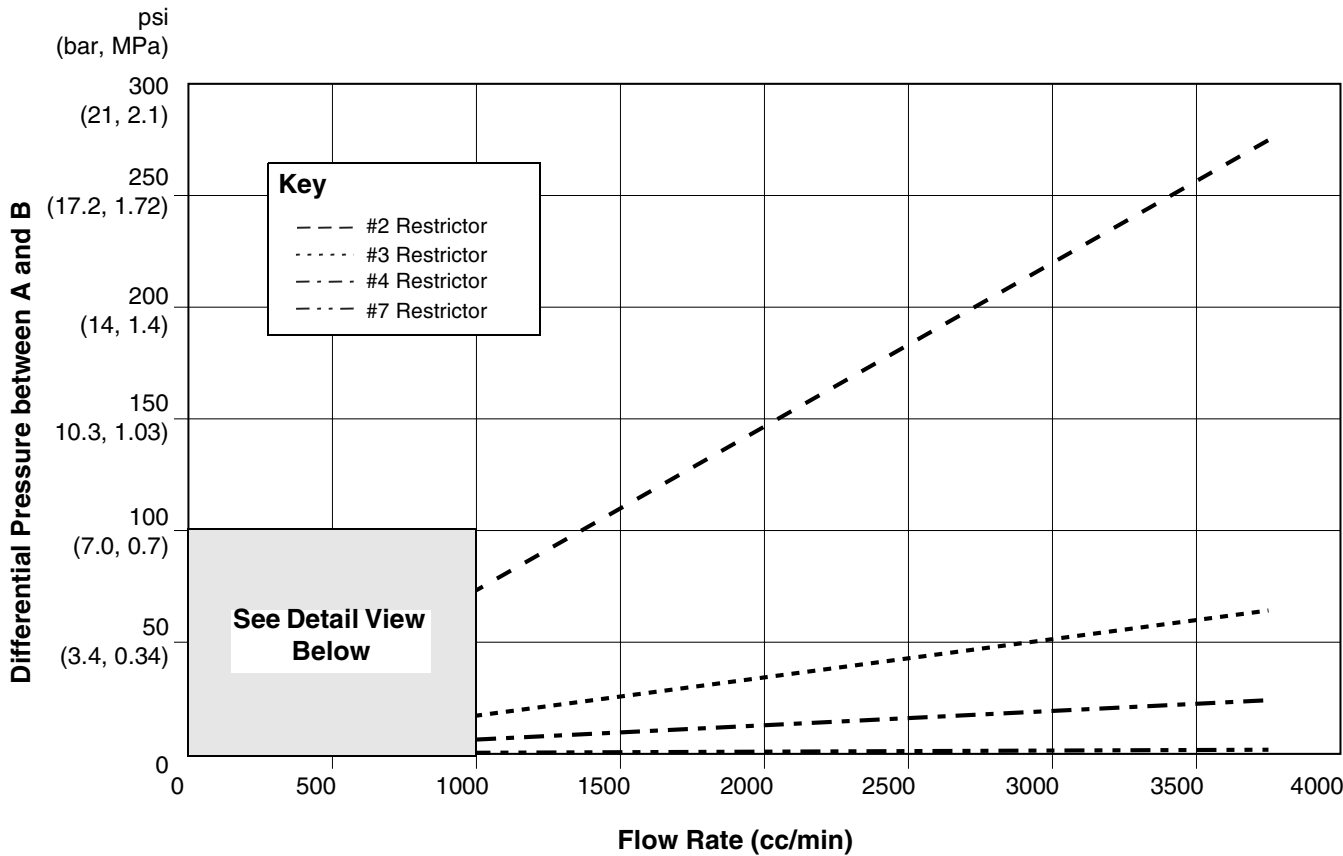


FIG. 22. Dynamic Dosing Performance (20:1 Ratio, 90 centipoise fluid, 100 psi A side pressure)

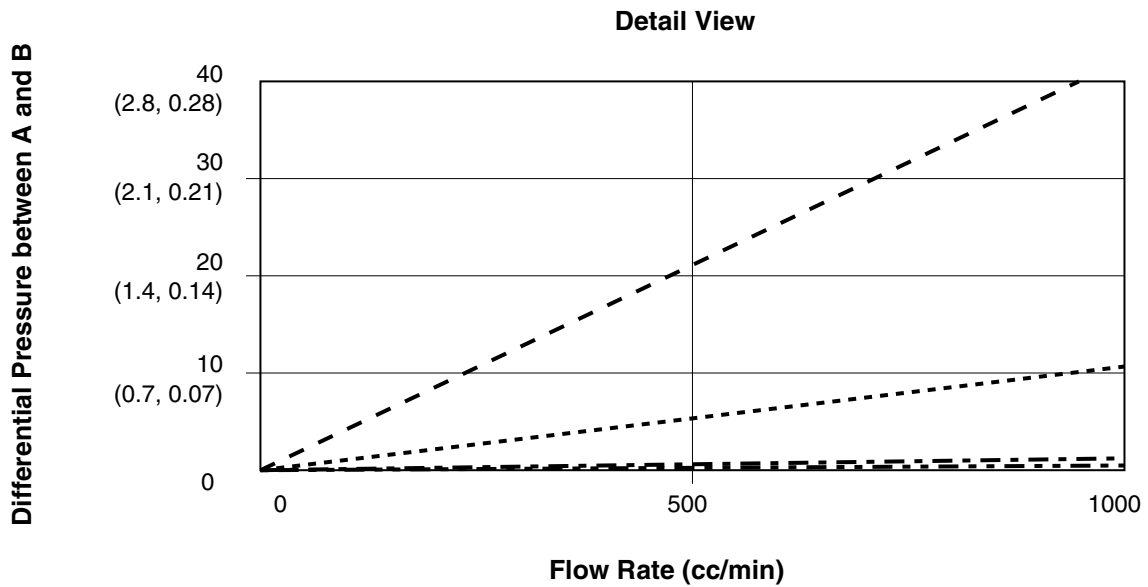
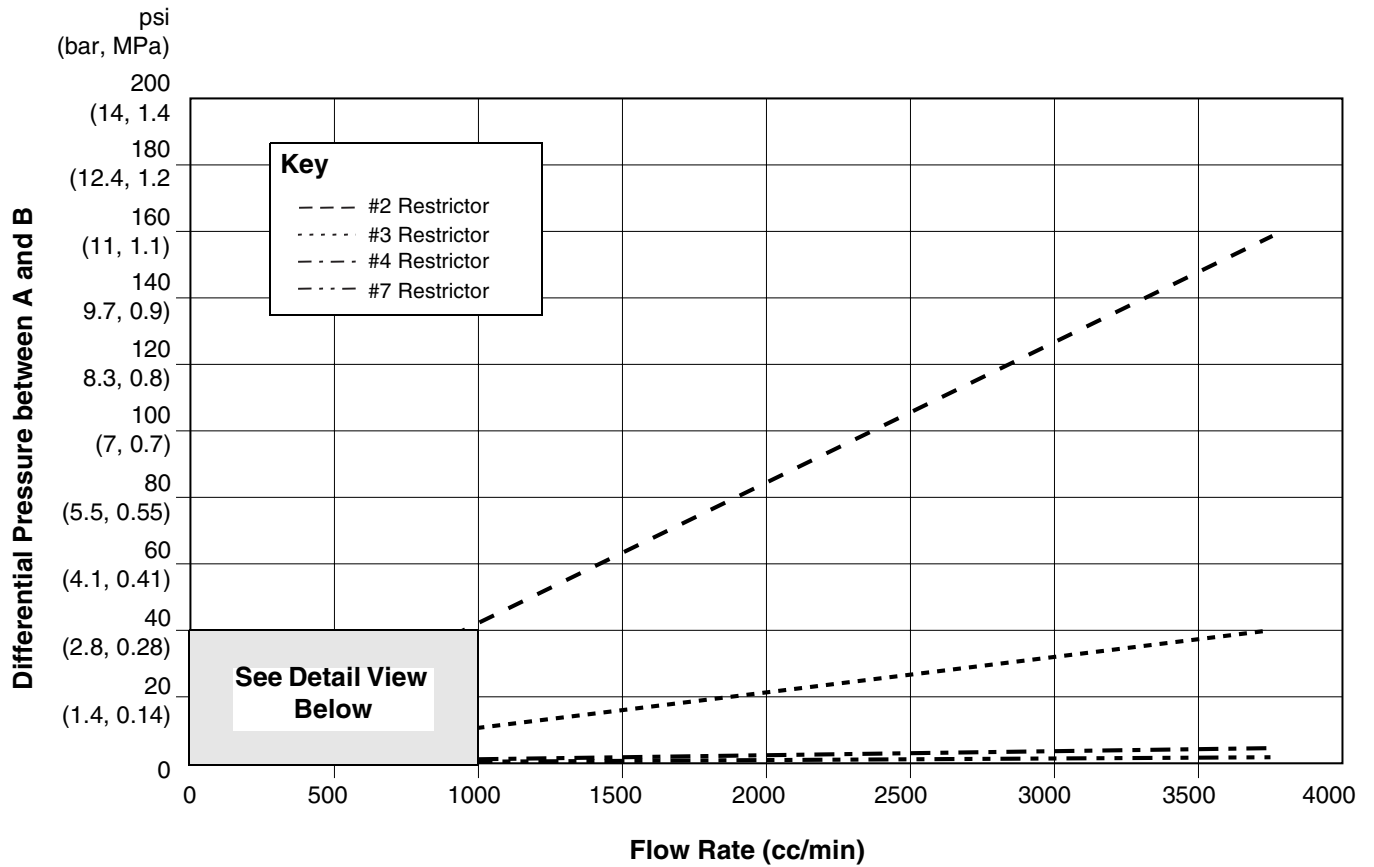


FIG. 23. Dynamic Dosing Performance (30:1 Ratio, 90 centipoise fluid, 100 psi A side pressure)



Technical Data

Maximum fluid working pressure	<i>Base system:</i> 4000 psi (28 MPa, 280 bar) <i>Low pressure color change:</i> 300 psi (2.1 MPa, 21 bar) <i>High pressure color change:</i> 3000 psi (21 MPa, 210 bar) <i>Coriolis meter:</i> 2300 psi (16.1 MPa, 161 bar)
Maximum working air pressure	100 psi (0.7 MPa, 7 bar)
Air supply	75 - 100 psi (0.5 - 0.7 MPa, 5.2 - 7 bar)
Air filter inlet size	3/8 npt(f)
Air filtration for air logic and purge air (Graco-supplied) . .	5 micron (minimum) filtration required; clean and dry air
Air filtration for atomizing air (user-supplied)	30 micron (minimum) filtration required; clean and dry air
Mixing ratio range	0.1:1- 50:1*
On-ratio accuracy	up to $\pm 1\%$, user selectable
Fluids handled	one or two component: • solvent and waterborne paints • polyurethanes • epoxies • acid catalyzed varnishes • moisture sensitive isocyanates
Viscosity range of fluid	20- 5000 cps*
Fluid filtration (user-supplied)	100 mesh minimum
Fluid flow rate range*	
G3000, G250 Meter	75 - 3800 cc/min. (0.02-1.00 gal./min.)
G3000HR, G250HR Meter	38 - 1900 cc/min. (0.01-0.50 gal./min.)
Coriolis Meter	20 - 3800 cc/min. (0.005-1.00 gal./min.)
S3000 Solvent Meter (accessory)	38 - 1900 cc/min. (0.01-0.50 gal./min.)
Fluid inlet sizes	
Flow Meter	1/4 npt(f)
Dose Valve/Color Valve Adapters	1/4 npt(f)
Fluid outlet size (static mixer)	1/4 npt(f)
External Power Supply Requirements	85 - 250 Vac, 50/60 Hz, 2 amps maximum draw 15 amp maximum circuit breaker required 8 to 14 AWG power supply wire gauge
Operating temperature range	41- 122° F (5-50° C)
Environmental Conditions Rating	indoor use, pollution degree (2), installation category II
Noise Level	
Sound pressure level	below 70 dBA
Sound power level	below 85 dBA
Wetted parts	303, 304 SST, Tungsten carbide (with nickel binder), perfluoroelastomer; PTFE

* Dependent on programmed K-factor and application. The maximum allowable flow meter pulse frequency is 425 Hz (pulses/sec). For more detailed information on viscosities, flow rates, or mixing ratios, consult your Graco distributor.

See individual component manuals for additional technical data.

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

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Graco Information

For the latest information about Graco products, visit www.graco.com.

For patent information, see www.graco.com/patents.

TO PLACE AN ORDER, contact your Graco distributor or call to identify the nearest distributor.

Phone: 612-623-6921 **or Toll Free:** 1-800-328-0211 **Fax:** 612-378-3505

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Original instructions. This manual contains English. MM 312775

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

GRACO INC. AND SUBSIDIARIES • P.O. BOX 1441 • MINNEAPOLIS MN 55440-1441 • USA
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